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## **Towards a regulatory design for reducing emissions from agriculture**

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## **Towards a Regulatory Design for Reducing Emissions from Agriculture: Lessons from Australia's Carbon Farming Initiative**

Jonathan Verschuuren\*

### **Abstract**

The land sector is essential to achieve the Paris Agreement goals. Agriculture and land use contribute to between 20 and 25 per cent of global greenhouse gas emissions. The Paris Agreement's aim to keep the average global temperature rise between 1.5 and 2 degrees Celsius implies that drastic emission cuts from agriculture are needed. The sequestration potential of agriculture and land use offers an important mechanism to achieve a transition to net-zero carbon emissions worldwide. So far, however, states have been reluctant to address emissions from, and sequestration by, the agricultural sector. Some states that have or are setting up a domestic emission-trading scheme allow for the generation of offsets in agriculture, but only to a limited extent. Australia is the only country that has a fairly broad set of methodologies in place to award credits to farmers for all kinds of carbon-farming projects. This article reviews the experience with the Australian model so far, with the objective of articulating transferable lessons for regulatory design aimed at reducing greenhouse gas emissions from agriculture. It finds that it is possible to regulate for the reduction of emissions from agriculture and for increased sequestration in agricultural soils and in vegetation on agricultural lands, provided that certain conditions are met. Regulation must focus on individual projects at farms, based on a long-term policy that has a wider focus than just emission reduction. Such projects must comply with climate-smart methodologies that ensure the delivery of real, additional, measurable, and verifiable emission reductions and also foster long-term innovation and create economic, social, and environmental co-benefits. Moreover, a robust and reliable MRV system must be put in place.

### **Keywords**

Paris Agreement; climate-smart agriculture; carbon farming; carbon offsets; emissions from agriculture; soil carbon; carbon sequestration; emission trading.

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## 1. Introduction

Under the Paris Agreement, in order to hold the increase in the global average temperature well below 2 degrees Celsius above pre-industrial levels, a balance needs to be achieved between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century.<sup>1</sup> Although the Paris Agreement hardly mentions agriculture, both agriculture and land use are sectors that are important for the achievement of this goal.<sup>2</sup> Following decades of neglect, the international community is slowly starting to acknowledge this fact. A May 2016 UNFCCC Secretariat survey of states' INDCs shows that 74 per cent of the 138 INDCs submitted cover agriculture.<sup>3</sup> However, policies are generally lacking and need to be developed from scratch.

In its Fifth Assessment Report, the IPCC's Working Group III concludes that the AFOLU sector (agriculture, forestry, and other land use) is responsible for just under a quarter (~10-12 GtCO<sub>2</sub> eq./yr) of anthropogenic greenhouse gas emissions.<sup>4</sup> Usually, a distinction is made between non-CO<sub>2</sub> emissions, in particular methane emitted by livestock and from rice cultivation, and nitrous oxide from the use of synthetic fertilizers and the application of manure on soils and pasture. The global warming potentials of methane and nitrous oxide are, respectively, 25 times and 300 times that of CO<sub>2</sub>. CO<sub>2</sub> emissions from agriculture are mainly caused by deforestation and peatland drainage. Emissions from agriculture have been rising on a yearly basis since 1990, although with important regional differences (they went down in Europe and up in Asia).<sup>5</sup> So far, these emissions have not been specifically addressed under the UNFCCC, the Kyoto Protocol, or the Paris Agreement.<sup>6</sup> Domestic regulators have also been reluctant to address agricultural emissions.<sup>7</sup>

It is expected that under a business-as-usual scenario, emissions from agriculture will rise sharply over the coming years and decades because of an expected increase of 40 per cent or more in the demand for agricultural products, mainly in Asia.<sup>8</sup> The causes of

<sup>1</sup> Paris Agreement, art. 4.

<sup>2</sup> Joeri Rogelj, Michel den Elzen, Niklas Höhne, Taryn Fransen, Hanna Fekete, Harald Winkler, Roberto Schaeffer, Fu Sha, Keywan Riahi, and Malte Meinshausen, 'Paris Agreement Climate Proposals Need a Boost to Keep Warming Well Below 2 °C', 534 *Nature* 631 (2016). See also Jonathan Verschuuren, 'The Paris Agreement on Climate Change: Agriculture and Food Security', 7(1) *European Journal of Risk Regulation* 54-57 (2016).

<sup>3</sup> UNFCCC Secretariat, 'Aggregate Effect of the Intended Nationally Determined Contributions: An Update. Synthesis report by the secretariat', FCCC/CP/2016/2 (2016) at 32.

<sup>4</sup> P. Smith et al., 'Agriculture, Forestry and Other Land Use (AFOLU)' in *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge, UK: Cambridge University Press, 2014) at 816.

<sup>5</sup> *Ibid.*, at 823.

<sup>6</sup> Verschuuren, *supra* note 2; Jonathan Verschuuren, 'Climate Change and Agriculture under the United Nations Framework Convention on Climate Change and Related Documents', in *Research Handbook on Climate and Agricultural Law*, edited by Mary Jane Angelo and Anel DuPlessis (Cheltenham, UK: Edward Elgar, 2016).

<sup>7</sup> The IPCC points at 'implementation challenges, including institutional barriers and inertia related to governance issues', Smith et al., *supra* note 4, at 817.

<sup>8</sup> Bruce Campbell, Wendy Mann, Ricardo Meléndez-Ortiz, Charlotte Streck and Timm Tennigkeit, *Agriculture and Climate Change: A Scoping Report* (Washington, DC: Meridian Institute, 2011) at 3.

the rise in demand include the growing world population (from seven billion today to nine billion in 2050) and dietary changes caused by a wealthier middle class in countries such as China and India. In Australia, the agrifood sector expects to be able to increase its production by 77 per cent from 2007 levels by 2050 to meet this greater Asian demand.<sup>9</sup>

To address the expected rise in emissions from agriculture, many developed countries are in the process of integrating the land use sector into their climate policies. The EU, for example, will require the agricultural and land use sectors to fully contribute to achieving the EU's 2030 emission reduction target.<sup>10</sup> As explained below, the only country that already has a discrete regulatory instrument in place to reduce emissions from agriculture is Australia. Its 'Carbon Farming Initiative' (CFI) is now five years' old. Despite the country's much criticized poor overall climate policy, the CFI did spur farmers into action and, therefore, potentially provides the rest of the world with a model to reduce emissions from agriculture. This article reviews the experiences with this model so far, with the objective to articulate transferable lessons for regulatory design aimed at reducing greenhouse gas emissions from agriculture.

This article builds partly on desk research and partly on empirical research into stakeholders' experiences with the Australian scheme. First, a study of the relevant legal and policy documents was conducted, to find out the regulatory design of the Australian instrument, and its broader legal and policy background. Then, relevant stakeholders were interviewed, and case studies into selected projects were carried out, to discover the experiences of these stakeholders with the scheme, as well as the pros and cons of the regulatory approach. Stakeholders interviewed included the government authorities involved, such as the main regulator and administrator of the CFI, agricultural business organizations, consultants working with individual farmers ('carbon agents'), and financial institutions that finance farming businesses.<sup>11</sup> It should be noted that the article only focuses on the impact of the CFI on farming. It does not assess the impact of this instrument on other sectors, nor does it assess the broader Australian emissions reduction framework.

The article has been structured as follows. Section 2 gives a short introduction into current regulatory approaches to reducing emissions from agriculture, mapping the various examples across the world, as well as into the wider context of climate-smart agriculture. Section 3 gives a detailed description of current Australian legislation on reducing emissions from agriculture, as well as the science background of the CFI. Section 4 reports on the findings of the empirical research. Section 5 draws lessons from the Australian model.

## **2. Regulating Emissions from Agriculture Around the World**

<sup>9</sup> Climate Change Authority, *Reducing Australia's Greenhouse Gas Emissions: Targets and Progress Review—Final Report* (Canberra: Commonwealth of Australia, 2014) at 305.

<sup>10</sup> European Council, '2030 Climate and Energy Policy Framework', EUCO 169/14 (2014), at 5.

<sup>11</sup> The methodology of the empirical research is explained in more detail in section 4.1 below.

The most common policy instrument used to reduce greenhouse gas emissions is emission trading.<sup>12</sup> Emission-trading schemes exist in a large number of countries, states, provinces, and cities,<sup>13</sup> including the 28 EU member states and three associated states (EU ETS),<sup>14</sup> Switzerland (linkage with EU ETS is under discussion),<sup>15</sup> nine states in the northeastern United States (RGGI),<sup>16</sup> California,<sup>17</sup> the Canadian provinces of Quebec (linked to the California ETS),<sup>18</sup> Ontario (aimed to be linked with the California ETS and Quebec ETS),<sup>19</sup> and Alberta,<sup>20</sup> seven regions in China (aiming to scale up to the national level in 2017),<sup>21</sup> South Korea,<sup>22</sup> Kazakhstan,<sup>23</sup> New Zealand,<sup>24</sup> and the Japanese cities of Saitama and Tokyo.<sup>25</sup> Australia set up a national ETS in 2012; it was

<sup>12</sup> Harro Van Asselt, Michael Mehling and Clarisse Siebert, 'The Changing Architecture of International Climate Change Law', in *Research Handbook on Climate Change Mitigation Law* edited by Geert van Calster, Wim Vandenberghe, and Leonie Reins (Cheltenham, UK: Edward Elgar, 2015) at 20.

<sup>13</sup> For information on all of these emissions trading schemes, see the case study reports: Institute for Climate Economics, *Put a price on carbon: different models of carbon pricing around the world* (Paris: I4CE, 2015), <[www.i4ce.org/go\\_project/put-a-price-on-carbon-different-models-of-carbon-pricing-around-the-world/](http://www.i4ce.org/go_project/put-a-price-on-carbon-different-models-of-carbon-pricing-around-the-world/)> (last accessed on 29 August 2016).

<sup>14</sup> Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading, OJ L 275/32 (2003).

<sup>15</sup> Federal Act of 23 December 2011 on the Reduction of CO<sub>2</sub> Emissions (CO<sub>2</sub> Act), see <<https://www.admin.ch/opc/en/classified-compilation/20091310/index.html>> (last accessed on 29 August 2016). In January 2016, Switzerland and the EU reached an agreement on linkage of the Swiss and the EU ETS, see Environment Ministry press statement <[www.bafu.admin.ch/dokumentation/medieninformation/00962/index.html?lang=en&msg-id=60425](http://www.bafu.admin.ch/dokumentation/medieninformation/00962/index.html?lang=en&msg-id=60425)> (last accessed on 29 August 2016).

<sup>16</sup> This ETS is based upon regulations in each of the participating states. See the RGGI's website <[www.rggi.org/design/regulations](http://www.rggi.org/design/regulations)> (last accessed on 29 August 2016).

<sup>17</sup> Regulation for the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms, title 17, CCR, sections 95801-96022, <[www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial\\_ct\\_030116.pdf](http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_ct_030116.pdf)> (last accessed on 29 August 2016).

<sup>18</sup> The Québec Cap and Trade System for Greenhouse Gas Emissions Allowances, see <[www.mddelcc.gouv.qc.ca/changements/carbone/documentation-en.htm#regulations](http://www.mddelcc.gouv.qc.ca/changements/carbone/documentation-en.htm#regulations)> (last accessed on 29 August 2016).

<sup>19</sup> The Climate Change Mitigation and Low Carbon Economy Act was adopted on 18 May 2016 and the Cap and Trade Regulation took effect on 1 July 2016, see <<https://www.ontario.ca/page/cap-and-trade>> (last accessed on 29 August 2016).

<sup>20</sup> Specified Gas Emissions Regulation, Alberta Regulation 139/2007, see <<http://aep.alberta.ca/climate-change/guidelines-legislation/specified-gas-emitters-regulation/default.aspx>> (last accessed on 29 August 2016).

<sup>21</sup> See in much detail Huizhen Chen, *Towards a Market-Based Climate Policy in China? A Legal Perspective on the Design and Application of Greenhouse Gas Emissions Trading* (doctoral thesis University of Maastricht, 2015), and Jiang Xiaoyi, 'Climate change and energy law' in *Research Handbook on Chinese Environmental Law* edited by Qin Tianbao (Cheltenham: Edward Elgar 2015) 162-95.

<sup>22</sup> Act on Allocation and Trading of Greenhouse Gas Emissions Allowances (2012). Trading under the ETS started in 2015. See <<http://eng.me.go.kr/eng/web/index.do?menuId=450&findDepth=1>> (last accessed on 29 August 2016).

<sup>23</sup> Based on amendments to the Kazakhstan Ecological Code (2011), and largely modelled on the EU ETS. See <[http://adilet.zan.kz/eng/docs/K070000212\\_](http://adilet.zan.kz/eng/docs/K070000212_)> (last accessed on 29 August 2016).

<sup>24</sup> Climate Change Response (Emissions Trading) Amendment Act 2008, Act 2008 No. 85, see <<http://www.legislation.govt.nz/act/public/2008/0085/latest/DLM1130932.html>> (last accessed on 29 August 2016).

<sup>25</sup> Marion Afriat, Katherine Rittenhouse and Katie Kouchakji, 'Tokyo: A Case Study on Emissions Trading', in Institute for Climate Economics, *supra* note 13.

repealed in 2015, before trading commenced.<sup>26</sup> (Australia's CFI remained in place as a stand-alone instrument following the repeal of the ETS.)

None of these schemes directly apply to emissions from agriculture, although some allow offsets from agriculture as will be explained below. In New Zealand, it was initially planned to require farmers to surrender allowances under the ETS, but this plan was dropped in 2012 following a successful lobby by the agriculture sector.<sup>27</sup> The inclusion of farming in an ETS is considered problematic because of the difficulty of measuring emissions and emission reductions at the farm level. Non-CO<sub>2</sub> emissions from livestock and the use of fertilizers can be fairly easily estimated at the *national* level<sup>28</sup> using uniform emission factors (per animal, per unit of arable land, etc.).<sup>29</sup> This is why non-CO<sub>2</sub> emissions from agriculture are assessed and regulated at a generic, sector-wide level, following the IPCC's instructions for calculating emissions from agriculture.<sup>30</sup> At the individual farm level, actual emissions are much more difficult to measure because of the variety of factors involved (such as the diet of individual animals, tillage intensity, soil composition, weather systems of individual regions, the way in which fertilizer is applied, etc.).<sup>31</sup> Even more difficult to estimate are agriculture's CO<sub>2</sub> emissions, as CO<sub>2</sub> removals must also be accounted for. The use of uniform emission criteria to overcome the measurement problems at individual farms has the disadvantage that it diminishes the incentive of individual farmers to change their practices; it is also more vulnerable to fraud because of the disconnect with real life emissions.<sup>32</sup> A farm-specific monitoring and measurement system is expensive and

<sup>26</sup> Carbon Credits (Carbon Farming Initiative) Act 2011 as amended in 2014. See Climate Change Authority, *supra* note 9, at 77-83.

<sup>27</sup> David Bullock, 'Emissions Trading in New Zealand: Development, Challenges and Design', 21(4) *Environmental Politics* 657 (2012) at 661. Under the Climate Change Response (Emissions Trading and Other Matters) Amendment Act 2012, the obligation to surrender allowances for agricultural emissions was suspended. What remained is the requirement for farmers in some sectors (meat processors, dairy processors, nitrogen fertilizer manufacturers and importers, and live animal exporters) to report biological emissions from methane and nitrous oxide that are produced on-farm. See <<http://www.climatechange.govt.nz/emissions-trading-scheme/ets-amendments/>> (last accessed on 29 August 2016).

<sup>28</sup> Peter Wehrheim and Asger Strange Oleson, 'Land Use, Land Use Change and Forestry – How to Enter the Climate Impact of Managing Biospheres and Wood into the EU's Greenhouse Accounting' in *Research Handbook on Climate Change Mitigation Law* edited by Geert van Calster, Wim Vandenberghe, and Leonie Reins (Cheltenham, UK: Edward Elgar, 2015) at 304.

<sup>29</sup> Andrew Macintosh and Lauren Waugh, 'An Introduction to the Carbon Farming Initiative: Key Principles and Concepts', 29(6) *Environmental and Planning Law Journal* 439 (2012) at 445-6.

<sup>30</sup> IPCC, Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (see especially the chapter on agriculture in Volume 2, <<http://www.ipcc-nggip.iges.or.jp/public/gl/invs5c.html>> (last accessed on 29 August 2016)). See in more detail Verschuuren, *supra* note 6 at 31-34. In the EU, emissions from agriculture have been included in the Effort Sharing Decision (Decision 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the Effort of Member States to Reduce their Greenhouse Gas Emissions to Meet the Community's Greenhouse Gas Emission Reduction Commitments up to 2020, OJ L 140/136 (2009)), which means that agricultural emissions, together with emissions from other non-ETS sectors, are subject to an overall reduction target for each member state. Individual Member States are free to choose how and where they are achieving this overall target, see Wehrheim and Oleson, *supra* note 26, at 313.

<sup>31</sup> Hugh Saddler and Helen King, 'Agriculture and Emissions Trading: The Impossible Dream?' (Discussion Paper Series No. 102, The Australia Institute, 2008), at 102.

<sup>32</sup> Macintosh and Waugh, *supra* note 29.

involves a large number of actors.<sup>33</sup> Australia, for one, has more than 123,000 agricultural businesses.<sup>34</sup> Measuring their greenhouse gas emissions and carbon sequestration individually could be an administrative nightmare.

Under some of the emission-trading schemes mentioned above, credits can be generated from agriculture to be used as offsets by industries required to submit emission allowances. This is the case in California, Quebec, Alberta, Ontario, and under the RGGI; and it was the case in the Australian scheme. Under California's ETS, two types of agricultural offset project are accepted, each aimed at reducing methane emissions: biogas systems in dairy cattle and swine farms,<sup>35</sup> and rice-cultivation projects.<sup>36</sup> Alberta accepts a wide range of agricultural offset projects: nitrous-oxide emission reductions, biofuel production and usage, waste biomass projects, several renewable-energy production and usage projects, conservation cropping, several types of project involving beef production (low residual feed intake, reduced age at harvest, reduced days on feed), projects aimed at reducing emissions from dairy cattle, and biogas production.<sup>37</sup>

In some countries, agricultural offsets are linked to other regulatory instruments aimed at reducing GHG emissions. Japan has an elaborate offset credit system (J-VER), linked to various, mostly voluntary, programmes for industry and the energy sector.<sup>38</sup> The scheme allows individuals, businesses, and local governments to invest in offset projects, with the aim not only to reduce emissions but also to expand job opportunities, support domestic project proponents, and vitalize local industries.<sup>39</sup> Project registration and credit issuance requires verification by accredited bodies under the ISO14065 accreditation programme. Four agricultural methodologies were adopted under this system: mitigation of nitrous-oxide emissions from tea-land soil by application of chemical fertilizers containing a nitrification inhibitor; mitigation of methane emissions from flooded rice paddies by application of composts instead of rice straws; reduction in emissions from livestock excrement management through changed management methods; and reduction in emissions from the disposal of pig excreta through replacement of conventional feed with low-protein formula feed.<sup>40</sup> Under South

<sup>33</sup> Ibid.

<sup>34</sup> Australian Bureau of Statistics, data for 2015, see

<<http://www.abs.gov.au/ausstats/abs@.nsf/mf/4627.0>> (last accessed on 29 August 2016).

<sup>35</sup> The methodology for the implementation of these systems has been laid down in the Compliance Offset Protocol Livestock Projects. Capturing and Destroying Methane from Manure Management Systems, adopted by the California EPA's Air Resources Board on 14 November 2014,

<<http://www.arb.ca.gov/regact/2014/capandtrade14/ctlivestockprotocol.pdf>> (last accessed on 29 August 2016).

<sup>36</sup> See Compliance Offset Protocol Rice Cultivation Projects, adopted 25 June 2015,

<<http://www.arb.ca.gov/cc/capandtrade/protocols/rice/riceprotocol2015.pdf>> (last accessed on 29 August 2016).

<sup>37</sup> For more information, see the Alberta Ministry for Agriculture and Forestry's website,

<[http://www1.agric.gov.ab.ca/\\$Department/deptdocs.nsf/all/cl11618](http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/cl11618)> (last accessed on 29 August 2016).

<sup>38</sup> Marion Afriat, Katherine Rittenhouse and Katie Kouchakji, 'Japan: A Case Study on Carbon Pricing' in Institute for Climate Economics, *supra* note 13.

<sup>39</sup> See the government website on the offset credit scheme <[http://www.j-ver.go.jp/e/about\\_jver.html](http://www.j-ver.go.jp/e/about_jver.html)> (last accessed on 29 August 2016).

<sup>40</sup> Ibid.



Africa's draft Carbon Tax Bill,<sup>41</sup> the agricultural sector will be exempt from carbon taxes, at least until 2020.<sup>42</sup> Instead, liable entities will be able to generate offsets in the agricultural sector. Eligible offset projects aim to restore subtropical thickets, forests, and woodlands, restore and manage grasslands, and support small-scale afforestation, biomass-energy production, anaerobic biogas digesters, and reduced tillage.<sup>43</sup>

As a final introductory remark, it should be noted that the carbon-farming initiatives mentioned above are primarily aimed at mitigation of GHG emissions. They are not aimed at improving the resilience of the agricultural sector to the impacts of climate change. As such, carbon farming has a narrower scope than climate-smart agriculture (CSA). CSA is an approach to developing the technical, policy, and investment conditions to achieve sustainable agricultural development for food security under climate change, and is composed of three main pillars: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing or removing greenhouse gas emissions.<sup>44</sup> Carbon-farming initiatives, given their focus on GHG emission cuts from agriculture and increased carbon sequestration in agricultural soils and vegetation, are important elements of a regulatory regime on CSA, but must be complemented by instruments aimed at adaptation and food security. In practice, increased resilience is often a side-effect of carbon-offset projects in agriculture, particularly of those projects aimed at increased carbon sequestration in soils and planting vegetation on agricultural lands, as these lead to more fertile soils and better moisture retention and thus to increased production, better water management, and reduced fertilizer use. A recent literature review found that increasing soil carbon can have profound effects on soil quality and agro-ecosystem productivity. Soil carbon plays an important role in maintaining soil structure, improving soil-water retention, fostering healthy soil microbial communities, and providing fertility for crops.<sup>45</sup> Also, soil-carbon projects are often part of the introduction of wider regenerative practices that focus on soils, water, and biodiversity.<sup>46</sup> That is why in my research for this article, attention was paid to potential

<sup>41</sup> The Draft Carbon Tax Bill was published in November 2015, see <[http://www.treasury.gov.za/public\\_comments/CarbonTaxBill2015/Carbon Tax Bill final for release for comment.pdf](http://www.treasury.gov.za/public_comments/CarbonTaxBill2015/Carbon%20Tax%20Bill%20final%20for%20release%20for%20comment.pdf)> (last accessed on 29 August 2016). The new system of carbon taxes is expected to take effect as of January 2017. Draft Carbon Offset Regulations were published on 20 June 2016, see <[http://www.treasury.gov.za/public\\_comments/CarbonTaxBill2016/Carbon offset Regulations.pdf](http://www.treasury.gov.za/public_comments/CarbonTaxBill2016/Carbon%20offset%20Regulations.pdf)> (last accessed on 29 August 2016).

<sup>42</sup> Michael Kidd, 'Climate Change and Agriculture' in *Climate Change Law and Governance in South Africa*, edited by Tracy-Lynn Humby, Louis Kotzé, Olivia Rumble, and Andrew Gilder (Cape Town: Juta, 2016), at ch. 17, p. 10.

<sup>43</sup> Olivia Rumble, Andrew Gilder, and Mansoor Parker, 'Carbon Pricing in South Africa' in *Climate Change Law and Governance in South Africa*, edited by Tracy-Lynn Humby, Louis Kotzé, Olivia Rumble, and Andrew Gilder (Cape Town: Juta, 2016), at ch. 20, p. 35.

<sup>44</sup> FAO, *Climate Smart Agriculture Sourcebook* (Rome: FAO, 2013) at ix.

<sup>45</sup> Daniel Kane, *Carbon Sequestration Potential on Agricultural Lands: A Review of Current Science and Available Practices* (Washington, DC: National Sustainable Agriculture Coalition, 2015) at 18. See also, among many others, Rattan Lal, 'Societal Value of Soil Carbon', 69(6) *Journal of Soil and Water Conservation* 186A (2014); F. Alliaume, W.A.H. Rossing, M. García, K.E. Giller, and S. Dogliotti, 'Changes in Soil Quality and Plant Available Water Capacity Following Systems Re-design on Commercial Vegetable Farms', 46 *European Journal of Agronomy* 10 (2013).

<sup>46</sup> In Australia, for example, there is growing support for such programmes as 'soils for life' and 'healthy soils'. Case studies show remarkable results of reduced carbon emissions, better growing conditions, more water availability, and more biodiversity, see <<http://www.soilsforlife.org.au>> and <<http://www.healthysoils.com.au>> (last accessed on 29 August 2016).

co-benefits of Australian carbon farming projects for adaptation and food security, as shown below.

### **3. Australia's Carbon Farming Initiative**

This section gives a detailed description of current Australian legislation on reducing emissions from agriculture (3.2). First, I will give a brief sketch of the science background to the legislation.

#### **3.1. Science Background to the CFI**

##### **3.1.1. Australia's GHG Emissions**

Australia is a high-emitting country in terms of both total and per-capita emissions.<sup>47</sup> In 2015, Australia's emissions, including LULUCF, totaled 535.7 Mt CO<sub>2</sub> eq. (529.2 Mt CO<sub>2</sub> eq. excluding LULUCF),<sup>48</sup> 2.5 per cent below 2000 levels.<sup>49</sup> Australia has the highest emissions per capita of all developed countries.<sup>50</sup> On average, Australians emit 17.3 t CO<sub>2</sub> eq. per person, compared to 6.7 t CO<sub>2</sub> eq. in the EU.<sup>51</sup> In Australia, per capita emissions went up 7 per cent between 1990 and 2014.<sup>52</sup> By comparison, in the United States and the EU they went down 16 and 27 per cent, respectively, over the same period.<sup>53</sup> Australia is responsible for about 1.3 per cent of the world's GHG emissions, making it the fifteenth highest emitter in the world.<sup>54</sup> The Climate Change Performance Index, which rates the climate-protection performance of 58 countries, which together are responsible for more than 90 per cent of global energy-related CO<sub>2</sub> emissions, has Australia in the category of 'very poor'. Indeed, Australia is near the bottom of the list; only Kazakhstan and Saudi Arabia perform worse.<sup>55</sup>

Most publications on Australia's climate change policies begin by referring to the dominance of coal in Australia as an explanation of why climate change policy and regulation in Australia remains underdeveloped.<sup>56</sup> Mining contributes about 8 per cent

<sup>47</sup> Climate Change Authority, *supra* note 9, at 69.

<sup>48</sup> Department of the Environment, Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2015 (Canberra: Commonwealth of Australia, 2016) at 7.

<sup>49</sup> *Ibid.* at 34.

<sup>50</sup> *Ibid.* at 69.

<sup>51</sup> Jos G. J. Olivier, Greet Janssens-Maenhout, Marilena Muntean and Jeroen A.H.W. Peters, *Trends in Global CO<sub>2</sub> Emissions: 2015 Report* (The Hague: Netherlands Environmental Assessment Agency, Institute for Environment and Sustainability of the European Commission's Joint Research Centre, 2014) at 31.

<sup>52</sup> *Ibid.*

<sup>53</sup> *Ibid.*

<sup>54</sup> Climate Change Authority, *supra* note 9, at 69.

<sup>55</sup> Jan Burck, Franziska Marten and Christoph Bals, *The Climate Change Performance Index. Results 2016* (Bonn: Germanwatch & Climate Action Network, 2016) at 9.

<sup>56</sup> For example, Hari M. Osofsky and Jacqueline Peel, 'The Role of Litigation in Multilevel Climate Change Governance: Possibilities for a Lower Carbon Future?' 30(4) *Environmental and Planning Law Journal* 303-28 (2013) at 312-13, as well as Climate Change Authority, *supra* note 9, at 69.

to GDP.<sup>57</sup> Australia is the fourth largest coal producer (after China, the United States, and India).<sup>58</sup> Australia, which has vast coal reserves,<sup>59</sup> was the world's largest coal exporter until 2011, when it was overtaken by Indonesia.<sup>60</sup> The fact that Australia's economic growth has stayed above the OECD average is attributed largely to a booming mining sector.<sup>61</sup> Domestic energy supply is generated mainly by coal (at 74 per cent, it is well above the OECD average of 20 per cent) and natural gas (12 per cent).<sup>62</sup> Renewables account for 14 per cent of domestic energy production.<sup>63</sup>

### 3.1.2. Emissions from Agriculture

Agriculture contributes about 4 per cent to Australia's GDP.<sup>64</sup> Excluding emissions from LULUCF, agriculture accounted for 13 per cent of Australia's emissions in 2015.<sup>65</sup> Three-quarters of this is caused by livestock keeping (mostly from enteric fermentation). The remaining one quarter is evenly shared between cropping and savanna burning.<sup>66</sup> Emissions fluctuate with droughts, when livestock populations go down, followed by decreasing emissions.<sup>67</sup> On average, however, emissions from agriculture have been fairly stable and are expected to grow through to 2030.<sup>68</sup> Although there is a steady progress in reducing emissions per tonne of livestock produce partly as a result of the pricing mechanism introduced through the CFI, discussed below, the substantial increase in the livestock population causes overall emissions to go up.<sup>69</sup> Because Australia is in a good position to meet the increasing demand for agrifood commodities in emerging economies in Asia, its production of agrifood may increase by as much as 77 per cent from 2007 levels by 2050.<sup>70</sup> The expected production growth is likely to offset emission reductions achieved through the introduction of climate-smart agriculture practices and technologies.<sup>71</sup>

## 3.2. *Current Regulatory Framework for Emission Reductions from Agriculture*

### 3.2.1. Introduction: Rise and Fall of Emission Trading in Australia

<sup>57</sup> Australian Bureau of Statistics, *Year Book Australia* (2012) at 1301.0, <<http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1301.0~2012~Main%20Features~Mining%20Industry~150>> (last accessed on 29 August 2016).

<sup>58</sup> World Energy Council, *World Energy Resources: Coal* (London: World Energy Council, 2013) at 1.3.

<sup>59</sup> *Ibid.* at 1.14-15.

<sup>60</sup> *Ibid.* at 1.6.

<sup>61</sup> Peter Downes, Kevin Hanslow and Peter Tulip, 'The Effect of the Mining Boom on the Australian Economy' (Research Discussion Paper No. 2014-08, Reserve Bank of Australia, 2014).

<sup>62</sup> Australian Energy Regulator, *State of the Energy Market 2014* (Melbourne: Australian Energy Regulator, 2014) at 25 and 27 respectively.

<sup>63</sup> *Ibid.* at 27.

<sup>64</sup> Australian Bureau of Statistics, *supra* note 34.

<sup>65</sup> Department of the Environment, *supra* note 48, at 14-15.

<sup>66</sup> Climate Change Authority, *supra* note 9, at 300. Note that emissions from savanna burning are reported under LULUCF rather than under agriculture, see Department of the Environment, *supra* note 48, at 14.

<sup>67</sup> *Ibid.* at 301.

<sup>68</sup> *Ibid.* at 301-302. Beef cattle is expected to grow by 28 per cent between 2008 and 2030, sheep by 14 per cent and poultry by 16 per cent.

<sup>69</sup> *Ibid.*

<sup>70</sup> *Ibid.* at 305.

<sup>71</sup> *Ibid.*

In 2011, an Australian emission-trading scheme, following the EU's example, was set up by the federal Clean Energy Act 2011; it took effect on 1 July 2012.<sup>72</sup> The scheme included the energy sector, major industrial activities, mining, domestic shipping, domestic aviation, rail transport and non-transport use of fuels, waste (accepted by landfills after 1 July 2012), and fugitive emissions. It covered roughly 50 per cent of Australia's emissions. A fixed price was set for the first three years: AU\$23 (US\$17) per tonne CO<sub>2</sub> eq. for the first year, increasing by 2.5 per cent in each of the two subsequent years.<sup>73</sup> Trading was to commence on 1 July 2015, on which date the Australian ETS was to be linked to the EU ETS. A price cap and a price floor were set for the first three trading years (until 2018).<sup>74</sup> The scheme's cap on emissions was set to achieve a modest 5 per cent reduction below 2000 levels by 2020, in line with Australia's pledge under the UNFCCC. The independent Climate Change Authority was created to oversee the system and to advise the government on the functioning of the ETS.

Emissions from agriculture, forestry, land use, and landfills (waste accepted before 1 July 2012) were not included in the ETS. There were several reasons for this, including that (1) agricultural, forestry, and land-use sources and sinks are diffuse and involve a large number of actors, which would lead to a sharp increase in the number of liable entities and administration costs; (2) as indicated above, emissions and sequestration are difficult and expensive to monitor and measure; reverting to simplified estimation methodologies bears the risk of reducing incentives to reduce emissions or becoming sensitive to fraud; and (3), most importantly, there was strong political opposition, with the agriculture and forestry sectors in Australia having considerable political influence.<sup>75</sup>

A separate system, linked to the ETS, was designed for these activities. It was implemented through the Carbon Credits (Carbon Farming Initiative) Act 2011 (CFI Act).<sup>76</sup> The Act allowed for emission offset projects to be proposed, which, once accepted, would lead to the issuance of Australian Carbon Credit Units (ACCUs) for each tonne of CO<sub>2</sub> eq. emissions abated or sequestered. ACCUs could be purchased by firms in sectors included in the ETS to meet their obligations. In the fixed-price period (2012-2015), entities regulated under the ETS could rely on CFI credits for only 5 per cent of their emissions; following 2015, there would be no such limitation. Some of the credits were also recognized under the Kyoto Protocol, and could, therefore, also be

<sup>72</sup> Clean Energy Act 2011, No. 131 (2011). See Elena de Lemos Pinto Aydos, 'Australia's Carbon Pricing Mechanism' in *Carbon Pricing, Growth and the Environment* edited by Larry Kleiser, Ana Yábar Sterling, Pedro Herrera, Janet E. Milne and Hope Ashiabor (Cheltenham: Edward Elgar, 2012) at 261.

<sup>73</sup> At that time (1 July 2012) around €19, significantly above the EU's carbon price of €5 in 2012.

<sup>74</sup> Emma French, "'Greenbacks' versus Green Credits: has the Carbon Farming Initiative Got the Balance Right?' 30(5) *Environmental and Planning Law Journal* 434 (2013) at 449.

<sup>75</sup> Macintosh and Waugh, *supra* note 29. See also section 2 above.

<sup>76</sup> Carbon Credits (Carbon Farming Initiative) Act 2011, No. 101 (2011). See Celeste M. Black, 'Linking Land Sector Activities to Emissions Trading: Australia's Carbon Farming Initiative' in *Carbon Pricing, Growth and the Environment* edited by Larry Kleiser, Ana Yábar Sterling, Pedro Herrera, Janet E. Milne and Hope Ashiabor (Cheltenham: Edward Elgar, 2012) at 185; Andrew Macintosh, 'The Carbon Farming Initiative: Removing the Obstacles to its Success' 4(2) *Carbon Management* 185 (2013); Macintosh and Waugh, *supra* note 29.

sold on the international carbon market. In addition, the government allocated funds to buy up non-Kyoto credits generated under the CFI Act.

The Clean Energy Act was repealed just two years after its entry into force, following a change in government. The emission-pricing mechanism was replaced by an Emissions Reduction Fund (ERF, or Direct Action Plan), which took effect in April 2015. Under the ERF, the government purchases emission reductions offered by businesses, local governments, or others, through reverse auctions or other means. The CFI Act was used as a statutory vehicle to introduce the ERF's provisions.<sup>77</sup> The new scheme for energy, industry, and transport essentially applies the CFI system that was originally designed for agriculture, forestry, and landfills. Instead of a market-based system, the government buys up ACCUs generated through emission-reduction projects. A total budget of AU\$2.55 billion (US\$1.95 billion) has been allocated to purchase emission reductions between 2015 and 2019. All CFI projects pre-existing the reform automatically transitioned to the amended Act. CFI methodologies remained largely unchanged. ACCUs can also be sold in the private market as voluntary offsets. The Clean Energy Regulator (CER) is the government agency that administers the implementation of the scheme (auctions, registrations, compliance, etc.). The CFI Act is a very complex piece of legislation with hundreds of provisions, taking up more than three hundred pages of text, plus an additional seventy-nine pages of detailed provisions in the Carbon Credits (Carbon Farming Initiative) Rule 2015 (CFI Rule).<sup>78</sup>

### 3.2.2. The Carbon Credits (CFI) Act in More Detail

#### 3.2.2.1. *Projects*

ACCUs can be obtained for both emission-avoidance projects and sequestration projects. Agricultural emission-avoidance projects mostly focus on methane emission reductions: methane capture and combustion from livestock manure and methane emission reduction through manipulation of digestive processes of livestock. Another important emission-avoidance project for the agricultural sector is the application of urease or nitrification inhibitors aimed at reducing fertilizer and manure emissions. The sequestration projects covered are not specifically listed but are broadly defined.<sup>79</sup> Projects aimed at increased sequestration of carbon in soils are important examples of agricultural projects under this category. Most other sequestration projects are in the category of vegetation, which includes forestry (reforestation, improved forest management, reduced forest degradation, etc.). Although technically not agricultural projects, the latter type of project can be, and indeed is also very relevant for farmers, as it includes on-farm revegetation, rangeland or wetland restoration, the application of biochar to soil, and the establishment of permanent plantings.

<sup>77</sup> Carbon Farming Initiative Amendment Act 2014, No. 119 (2014).

<sup>78</sup> Carbon Credits (Carbon Farming Initiative) Rule 2015 of 13 February 2015.

<sup>79</sup> Projects that remove carbon dioxide from the atmosphere by sequestering carbon in living biomass, dead organic matter or soil, and/or projects that avoid emissions of greenhouse gasses from these three sources, S. 54.

Projects that result in the clearing of native forest are not allowed. Projects must generate 2,000 t CO<sub>2</sub> eq. a year on average.<sup>80</sup> Smaller projects, therefore, must seek collaboration and form aggregated projects.<sup>81</sup> Projects can be Kyoto or non-Kyoto projects or both (in the latter case, applicants can separate out eligible offsets from non-eligible ones).<sup>82</sup>

#### 3.2.2.2. *Methodology Determinations*

Projects are only eligible when covered by an approved methodology. Depending on the methodology, all kinds of conditions must be met to ensure that emission reductions are real and additional. Conditions are also set on reporting and auditing. An Emissions Reduction Assurance Committee (ERAC) has been set up to check whether certain integrity standards are applied.<sup>83</sup> According to these standards, abatement:

- is permanent and additional to business as usual ('additionality test')
- is measurable and verifiable
- takes into account possible leakage (which must be deducted from the abatement)
- meets internationally recognized accounting standards
- is supported by relevant (peer reviewed) science
- accounts for cyclical variability.<sup>84</sup>

A proponent of a project may apply for approval of a methodology, or the ERAC may approve a methodology of its own accord. A methodology can be project-specific, but ideally it should be applicable to future similar projects. A methodology sets the rules on how to calculate emission reductions in the project, how to determine the baseline, and how to report, keep records, and monitor. Once endorsed by the ERAC, the relevant minister in the federal government confirms the methodology.

Methodologies are regularly updated. For the agricultural sector, the following methodologies had been established as of June 2016:<sup>85</sup>

- Beef cattle herd management
- Destruction of methane from piggeries using engineered biodigesters
- Destruction of methane generated from dairy manure in covered anaerobic ponds
- Destruction of methane generated from manure in piggeries
- Estimating sequestration of carbon in soil using default values
- Fertilizer use efficiency in irrigated cotton

<sup>80</sup> S. 66 CFI Rule.

<sup>81</sup> The Emissions Reduction Fund White Paper suggests that this minimum can be changed later, Australian Government, 'Emissions Reduction Fund White Paper' (Canberra: Commonwealth of Australia, 2014) at 45.

<sup>82</sup> S. 11 CFI Act.

<sup>83</sup> S. 254 CFI Act; formerly known as Domestic Offsets Integrity Committee.

<sup>84</sup> S. 133 CFI Act.

<sup>85</sup> Several other methodology determinations had been revoked in 2015 following the start of the ERF, while others were amended. For an up-to-date overview of all methods, see <<https://www.environment.gov.au/climate-change/emissions-reduction-fund/methods>> (last accessed on 29 August 2016).

- Reducing greenhouse gas emissions in beef cattle through feeding nitrate containing supplements
- Reducing greenhouse gas emissions in milking cows through feeding dietary additives
- Sequestering carbon in soils in grazing systems.

To get a sense of the requirements imposed on participating farmers in these methodologies, I will consider two examples, one emission-avoidance method and one sequestration method.

Projects aimed at methane destruction in piggeries encompass installation and use of engineered biodigesters to treat manure, receiving the manure in the biodigesters (instead of an uncovered anaerobic lagoon) to undergo anaerobic decomposition, and installation of a flaring system that monitors performance.<sup>86</sup> Under this project type, it is also permitted to add additional waste to the biodigester, under strict conditions (limiting both the type and amount of waste added to the manure). The methodology lays down a wide range of detailed rules and conditions. It includes data-collection requirements, e.g. the quantity of biogas sent to a combustion device. Project owners are obliged to use a prescribed model to help them estimate the net abatement amount.<sup>87</sup> There are rules on how to calculate the baseline, the emissions associated with the project (e.g. emissions caused from additional energy use, which must be deducted from the avoided methane emissions), the net greenhouse gas abatement, and the net emissions avoided. The methodology also has extensive rules on monitoring, record keeping, and auditing. It lists all the matters that need to be monitored (23 in this example), prescribing the parameters and units, as well as the measurement procedure and measurement frequency. It also lists 48 types of documentation that must be kept by the farmer. These include a Quality Assurance Plan (detailing how the optimum performance of the equipment will be maintained for the duration of the project), logs of operations of the gas-capture system, piggery-feed usage data and diet analysis, gas-flow meter information, and the methods of handling the digestate.

Another methodology is for sequestering carbon in soils in grazing systems.<sup>88</sup> These projects encompass a variety of measures aimed at improving carbon storage in soils. Soil carbon can be stored in grazing systems by increasing the amount of organic matter in agricultural soils, for instance by converting from continuous cropping to permanent pasture, undertaking pasture cropping, managing pasture through implementing pasture irrigation, applying organic or synthetic fertiliser to pastures (under certain conditions), or rejuvenating pastures, including through seeding (this also includes reducing nitrous-oxide emissions from soils through tillage), and by managing grazing through changing stocking rates, or altering the timing, duration, and intensity of grazing. Farmers can

<sup>86</sup> Carbon Credits (Carbon Farming Initiative) (Destruction of Methane from Piggeries using Engineered Biodigesters) Methodology Determination 2013, <<https://www.comlaw.gov.au/Details/F2015C00572>> (last accessed on 29 August 2016).

<sup>87</sup> The so-called 'PigBal' model, produced by the Government of Queensland and Australian Pork to calculate nutrient and salt content in the waste from a piggery.

<sup>88</sup> Carbon Credits (Carbon Farming Initiative) (Sequestering Carbon in Soils in Grazing Systems) Methodology Determination 2014. The complex, 112 page long document is available online <<https://www.comlaw.gov.au/Details/F2015C00582>> (last accessed on 29 August 2016).

select the measures they want to implement, but must adopt at least one new management activity. The land that is used for soil-carbon storage must be delineated in accordance with the CFI Mapping Guidelines,<sup>89</sup> and must consist of land that had permanent pasture for five years or was continuously cropped for the five years before the start of the project. The selected land is called a 'project area'. The farmer can exclude parts of the area from the project ('exclusion areas'). The methodology determination evolves around measuring soil carbon, which is done through sampling of soils by a qualified person, namely a technician with qualifications from a nationally accredited course or recognized by a nationally accredited institution, with competencies prescribed in the CFI Soil Sampling and Analysis Method and Guidelines.<sup>90</sup> The methodology sets detailed rules on sample collection and on the analysis of the samples. Sampling starts with baseline sampling, followed by sampling at regular intervals, and must take place at a depth of at least 30 centimeters. The methodology has rules on how to calculate the baseline carbon stock, the project carbon stock, and the project emissions, so as to calculate the net abatement amount. The calculations cover the amount of organic carbon in the soil, emissions of methane and nitrous oxide from livestock, emissions of nitrous oxide and carbon dioxide from synthetic fertilizer, emissions of carbon dioxide from lime, and emissions of nitrous oxide, methane, and carbon dioxide from tillage.

Sequestration projects can have a 100-year or a 25-year permanence period.<sup>91</sup> There are extensive rules on carbon maintenance.<sup>92</sup> A 'carbon maintenance obligation' is imposed upon the sequestration project proponent to avoid a situation where sequestered carbon is emitted after the credits have been issued. According to the obligation, it is not permitted to carry out activities on lands used for sequestration which result (or are likely to result) in a reduction below the benchmark sequestration level of the sequestration of carbon in the relevant carbon pool in the area.<sup>93</sup> The requirement must be registered in the relevant land title register.<sup>94</sup> Only 'permitted carbon activities' may occur on lands used for sequestration. If a reduction below the benchmark sequestration level occurs, the owner or occupier of the land must take all reasonable steps to ensure that the benchmark level is restored.<sup>95</sup> Monitoring requirements apply to monitoring the risk of reversal events and known erosion events in the project area, especially when a portion of the project area is subject to bare fallow, or to a fire or other event that reduces surface vegetation cover below 40 per cent, or when it is converted from permanent pasture to cropland with no pasture cover. Once again, the methodology lists

<sup>89</sup> Carbon Farming Initiative (CFI) Mapping Guidelines 2015, <<https://www.environment.gov.au/climate-change/emissions-reduction-fund/cfi/publications/cfi-mapping-guidelines-2015>> (last accessed on 29 August 2016).

<sup>90</sup> CFI Soil Sampling and Analysis Method and Guidelines 2014, <<https://www.environment.gov.au/climate-change/emissions-reduction-fund/methods/sequestering-carbon-in-soils>> (last accessed on 29 August 2016).

<sup>91</sup> S. 86A CFI Act.

<sup>92</sup> See extensively Pamela O'Connor, Sharon Christensen, WD Duncan, and Angela Phillips, 'From Rights to Responsibilities: Reconceptualising Carbon Sequestration Rights in Australia', 30(5) *Environmental and Planning Law Journal* 403 (2013).

<sup>93</sup> S. 97(9) CFI Act.

<sup>94</sup> S. 40 CFI Act.

<sup>95</sup> S. 97(10) CFI Act.



extensive documentation that must be kept by the farmer, as well as reporting requirements.

### 3.2.2.3. *Issuing ACCUs*

The second step, after the methodology has been approved, is the formal recognition of the project entity. It used to be that the project proponent had to apply to the Clean Energy Regulator for recognition under the scheme. The CER would grant recognition where the proponent was a 'fit and proper' person, not insolvent, etc. This step, however, was dropped with the conversion to the ERF, although the CER still checks that the applicant is a 'fit and proper' person.<sup>96</sup> The project will be compared with the relevant methodology and a check will be carried out that the emission reductions are real and additional. Up until 2015, as soon as a project was approved, the reporting period began. Since 2015, the proponent of an eligible project must first seek a carbon abatement contract (see next section). After the proponent has secured the funds, the project as well as the reporting obligation commence.

The reporting period is a period of between six months and two-to-five years (two for emission-avoidance projects and five for sequestration projects). Projects have multiple reporting periods. The reports must comply with the requirements of the methodology and usually have to be accompanied by an audit report.<sup>97</sup> Eligible projects have to undergo an initial audit within the first six months of the project, with at least two audits to follow.<sup>98</sup> The audits must be undertaken by auditors registered under the National Greenhouse and Energy Reporting Amendment Regulation 2015.<sup>99</sup> A report is used by the CER to calculate the number of ACCUs that have been generated by the project, using the approved methodology. For each t CO<sub>2</sub> eq., one ACCU is issued. For sequestration projects, generally there is a 5 per cent deduction to account for the risk of reversal.<sup>100</sup>

After the end of a reporting period, the CER may issue a certificate of entitlement in respect of the project for the reporting period.<sup>101</sup> That entitlement leads to the issuing of ACCUs into the applicant's account in the Emissions Reduction Fund Register.<sup>102</sup> This 'first person' can then transfer these units to someone else, either within Australia or internationally. Again, extensive rules regulate these transfers,<sup>103</sup> as well as the Register.<sup>104</sup> As already stated, since 2015, it is primarily the government that purchases the ACCUs, which are then transferred to a specified Commonwealth Registry account

<sup>96</sup> S. 60 CFI Act and more detailed rules of S. 60-64 CFI Rule, which, for instance, stipulate that the authorities can take into account whether individuals, bodies corporate and executive officers of bodies corporate committed criminal acts or offenses comprising of dishonest conduct or environmental offenses, both domestically or abroad, as well as 'any other events that the Regulator considers relevant.'

<sup>97</sup> S. 76(4) CFI Act.

<sup>98</sup> S. 72-80B CFI Rule.

<sup>99</sup> National Greenhouse and Energy Reporting Amendment (2015 Measures No. 2) Regulation 2015, No. 166 (2015).

<sup>100</sup> S. 16 CFI Act.

<sup>101</sup> S. 12 CFI Act.

<sup>102</sup> S. 11 CFI Act.

<sup>103</sup> S. 150-158 CFI Act.

<sup>104</sup> S. 167-169 CFI Act.

in accordance with the Australian National Registry of Emissions Units Act 2011.<sup>105</sup> The government is required to publish annual reports on its purchases.<sup>106</sup> Credits can be issued during the entire crediting period for the project, which is twenty-five years for a sequestration project and seven years for an emission-avoidance project, although different crediting periods may be set.<sup>107</sup> A project may have up to two crediting periods.

There are a number of situations in which already-generated ACCUs must be handed back. This is the case, for instance, when there has been a reversal of sequestration or when it becomes evident that ACCUs were issued based on false or misleading information.<sup>108</sup> Farmers do not have to hand back ACCUs in case carbon stocks are lost due to bushfire, drought, or pest attack, as long as they take reasonable steps to reduce the risk of these events and re-establish carbon stores.<sup>109</sup>

#### *3.2.2.4. Auctions and Carbon-Abatement Contracts*

As of July 2015, with the start of the ERF, a new phase was added, in which the CER, on behalf of the government, purchases ACCUs through a contract with the farmer. The CER can enter into fixed-price carbon-abatement contracts with proponents of eligible projects only. It may do so whether or not ACCUs have been created at that point in time. There is thus a timing mismatch.<sup>110</sup> Usually, a proponent will want to ensure that initial investments pay off, and will therefore seek a carbon-abatement contract before the project commences. Once a carbon-abatement contract has been secured, the proponent can seek funding for the project and secure a forward-investment contract. The total duration of a contract cannot be longer than ten years.<sup>111</sup>

The CER is free to decide how it purchases carbon abatement. It may do so through reverse auctioning, tendering, or by another method.<sup>112</sup> The purchasing process, however, is to comply with six principles: purchase the maximum amount of carbon abatement, against the least cost, with not unreasonable administrative costs, in a manner that ensures integrity, and that encourages competition and provides fair and ethical treatment of all participants.<sup>113</sup> So far, purchases have been through reverse auctions, in which a project proponent bids a price for the carbon abatement expected from the project.<sup>114</sup> The winning bids, i.e. those that achieve the largest amount of

<sup>105</sup> S. 20H CFI Act, and Australian National Registry of Emissions Units Act 2011, No. 99 (2011).

<sup>106</sup> S. 163A CFI Act.

<sup>107</sup> S. 69 CFI Act.

<sup>108</sup> S. 88 CFI Act.

<sup>109</sup> S. 91 CFI Act.

<sup>110</sup> Macintosh, *supra* note 76, at 191; Climate Change Authority, *Carbon Farming Initiative Review* (Canberra: Commonwealth of Australia, 2014), at 33. These costs, on the other hand, are deductible under tax law, Celeste Black and Michael Dirkis, 'Farming Carbon: Taxation Implications of the Carbon Farming Initiative', 21(1) *Revenue Law Journal* 1 (2012) at 13-14.

<sup>111</sup> S. 10 CFI Rule.

<sup>112</sup> S. 20F CFI Act.

<sup>113</sup> S. 20G(3) CFI Act.

<sup>114</sup> Auctions took place in April 2015, November 2015 and April 2016. The next auction is planned for November or December 2016. For auction results, see <<http://www.cleanenergyregulator.gov.au/ERF/Auctions-results>> (last accessed on 29 August 2016).

abatement against the lowest price, are contracted.<sup>115</sup> These are regular contracts under contract law.<sup>116</sup> Both regular government procurement law and public governance and accountability law, however, are not applicable.<sup>117</sup> Carbon-abatement contracts must be registered in the ERF Register.<sup>118</sup>

### 3.2.2.5. Compliance

The CER is responsible for the enforcement of the scheme. It monitors compliance, not only by checking the information at its disposal (project information, audited reports, etc.), but also by conducting independent audits itself<sup>119</sup> and by undertaking site inspections.<sup>120</sup> The CER can impose a range of administrative sanctions, such as requiring the relinquishment of a specific number of ACCUs (when issued on the basis of false or misleading information, or when a sequestration project ends before the end of the permanence period),<sup>121</sup> accepting so-called ‘enforceable undertakings’ from a regulated entity (these being written statements from a person or organization that they will do certain things to improve compliance with the legislation, which are published on the internet, and may, if breached, result in court action),<sup>122</sup> or issuing infringement notices. The CER can also pursue legal action for breaches of civil-penalty provisions, in which case pecuniary damages are sought through the court, for instance when the project proponent infringes carbon-maintenance obligations. Criminal sanctions, including imprisonment, may also apply.<sup>123</sup> If a person is convicted of an offence relating to fraudulent conduct and the issue of ACCUs is attributable to the commission of the offence, the court may order relinquishment of a specified number of ACCUs.<sup>124</sup>

### 3.2.3. Adding a Cap: The ‘Safeguard Mechanism’

On 1 July 2016, the so-called ‘safeguard mechanism’ took effect. This is laid down in the (amended) National Greenhouse and Energy Reporting Act 2007 and in related regulations.<sup>125</sup> It sets a (modest) cap on the emissions of Australia’s major GHG-emitting industrial and electricity facilities (>100,000 t CO<sub>2</sub> eq. a year), covering roughly half of all emissions. This is seen as an important supplement to the ERF, as without the cap, a decrease in emissions through the projects financed under the ERF might be accompanied by an increase elsewhere, thus rendering the ERF ineffective. As

<sup>115</sup> A model carbon abatement contract is available online through <<http://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Step-2-Contracts-and-auctions>> (last on accessed 29 August 2016).

<sup>116</sup> S. 20K CFI Act.

<sup>117</sup> S. 20J CFI Act determines that the Public Governance, Performance and Accountability Act 2013, nor the Commonwealth Procurement Rules under the Financial Management and Accountability Regulations 1997 apply.

<sup>118</sup> S. 168(5) CFI Act.

<sup>119</sup> S. 213-215 CFI Act.

<sup>120</sup> S. 194-208 CFI Act.

<sup>121</sup> S. 88-91 CFI Act.

<sup>122</sup> S. 237 CFI Act.

<sup>123</sup> Either under provisions on fraudulent conduct or false and misleading statements of the Criminal Code 1995, or under S. 234-235 CFI Act.

<sup>124</sup> S. 171 CFI Act.

<sup>125</sup> National Greenhouse and Energy Reporting Act 2007, No. 175 (2007) as amended through the Carbon Farming Initiative Amendment Act 2014, No. 119 (2014).

facilities can comply with the cap (called a ‘baseline’) by purchasing ACCUs (from farmers, for example) and surrendering them to offset their emissions,<sup>126</sup> the safeguard mechanism may be expected to lead to an increase in private purchases of ACCUs from non-ERF funded CFI projects.<sup>127</sup>

#### **4. Experiences with the Carbon Credits (CFI) Act**

After having described the regulatory design of the Australian instrument in the previous section, we now to practice, in order to discover the experiences of the various stakeholders involved with the scheme, as well as the pros and cons of the regulatory approach. In this section I report on the findings of my empirical research on Australia’s regulatory framework aimed at reducing emissions from agriculture. First, I explain the methodology used; I then discuss the implementation of the CFI Act by presenting information on the number of projects run by farmers under the Act, as well as an indication of the kinds of farm projects. There follows the largest part of this section, which reports on stakeholders’ views on the impact of the CFI Act, with a focus on farmers’ motivation to participate in the CFI/ERF, the role of consultants, the impact of the change from a market-based to a government-funded scheme, the financing gap, administration and compliance, the scope of the scheme and its methodologies, the results of the scheme for the environment as well as for individual farmers, and the way forward, taking account of questions of global food security.

##### **4.1. Methodology**

The empirical part of the research consisted of a brief case-study phase and a longer interview phase. Case studies into selected projects under the CFI/ERF were conducted to get a better understanding of the kinds of project that are run on farms and to provide some background information for the interviews. All of the 630 projects on the ERF Register (as of 1 May 2016) were assessed against pre-determined selection criteria.<sup>128</sup> A total of seven cases were selected: two cases of methane capture in piggeries, two cases of sequestration of grazing land, one case of reforestation, and two avoided-deforestation cases. Information for the case studies was primarily gathered through publicly available sources, such as government and media websites.

The bulk of the empirical data was generated in interviews with the main stakeholders at a general level, i.e. representative associations for the farming industry, consultancy firms that help farmers to apply and run projects under the CFI/ERF (‘carbon agents’), financial and accountancy firms that are actively involved with the CFI/ERF, and government officials working with the regulatory framework. At least 2-3 interviews took place within each of these four stakeholder categories, sometimes with more than

<sup>126</sup> S. 22XF National Greenhouse and Energy Reporting Act 2007.

<sup>127</sup> The first surrender of ACCUs to avoid excess emissions situation is due 28 February 2018, see <<http://www.cleanenergyregulator.gov.au/NGER/The-safeguard-mechanism/Key-dates>> (last accessed on 29 August 2016).

<sup>128</sup> E.g.: the projects should be representative also for the other parts of the world, the projects should entail different types of farms and different mitigation actions, the projects should, ideally, also entail some adaptation actions, the projects should be representative for its kind, the projects should be in various jurisdictions so as to find possible differences in implementation across jurisdictions.

one person from one organization participating. Leading members of the stakeholder organizations were interviewed, such as CEOs and directors, and sometimes specialized natural resources/sustainability managers, both past and present. They were the most qualified persons within each organization, given the law and policy focus of the project.<sup>129</sup> In addition to the interviews, some information on the functioning of the CFI/ERF, particularly its past functioning, was obtained from the Australian Climate Change Authority's 2014 review of the CFI.<sup>130</sup> The validity of the findings from the interviews was tested in one stakeholder seminar and two academic seminars and in two additional interviews with senior representatives of the carbon consultancy sector and of a major climate change NGO.<sup>131</sup>

## ***4.2. Introduction: Figures and Examples of Carbon-Farming Projects***

### **4.2.1. Number of On-Farm CFI/ERF Projects**

When the carbon-farming scheme took off, farmers were reluctant to participate. The majority of methodology determinations were for activities in the forest and waste sectors.<sup>132</sup> As of December 2014, there were 178 CFI projects.<sup>133</sup> Only 4 per cent of these were agricultural projects.<sup>134</sup> Only 1 per cent of the ACCUs were credited to agricultural projects.<sup>135</sup> By then, the CFI had led to a 2-per-cent reduction in emissions covered by the CFI.<sup>136</sup> All agricultural-project credits were issued to projects which destroyed methane generated from manure in piggeries.<sup>137</sup> According to the Climate Change Authority's review, poor participation by the agricultural sector was almost entirely attributed to policy uncertainty, i.e. uncertainty about the future of the heavily debated Australian ETS and the possible impact on the carbon price of linkage with the EU ETS.<sup>138</sup> Other (potential) barriers were: lack of methodologies; difficulty of compliance with methodologies; limited access to capital; lack of economies of scale on many farms; and difficulty of access to information about emission-reduction projects.<sup>139</sup> These challenges were exacerbated by the presence of many small and

<sup>129</sup> Interviews were conducted in April and May 2016. Due to EU ethics requirements, this article does not refer to the names of the persons interviewed. Interview reports for each interview are on file with the author. Anonymized interview reports are stored in the Tilburg University data storage facility.

<sup>130</sup> Climate Change Authority, *supra* note 108.

<sup>131</sup> The seminars took place in May and July 2016, the validation interviews in August 2016.

<sup>132</sup> Climate Change Authority, *supra* note 110, at 17.

<sup>133</sup> *Ibid.*, at 19.

<sup>134</sup> 46% were landfill and waste treatment projects, 19% were avoided deforestation projects, 19% were other types of forest projects, 13% were savanna burning projects. *Ibid.*, at 19.

<sup>135</sup> 61% of credits have been for landfill and waste treatment projects, 29% for avoided deforestation projects, 5% for reforestation and other forestry projects (these are likely to generate increasing amounts of credits over time because forest growth generally accelerates five to ten years after planting), 4% for savanna burning projects. *Ibid.*, at 20.

<sup>136</sup> As at 3 December 2014, 10.6 million credits had been issued. On average, this is about 2.5m tCO<sub>2</sub>-e per year.

<sup>137</sup> *Ibid.*, at 30.

<sup>138</sup> *Ibid.*, at 32. The review is very clear about this: 'Policy uncertainty plays havoc with price expectations, in this case about future prices for credits, because a change in policy settings can change demand. Heightened uncertainty over future prices increases the risks around expected revenue streams from a project, deterring some potential participants from taking up a project.'

<sup>139</sup> Climate Change Authority, *supra* note 9, at 304.

dispersed participants in the sector (55 per cent of Australia's farm businesses report operations valued at less than AU\$100,000/US\$76,500).<sup>140</sup>

The situation changed once the link with emission trading was cut off and the ERF became operational. The first reverse auction took place in April 2015, i.e. before the actual launch of the ERF. It was accessible only to those sectors covered by the original CFI scheme. About half of the proposed emission reductions (28 Mt CO<sub>2</sub> eq.) came from farm projects—mainly avoided deforestation and soil-sequestration projects. While the agricultural sector feared that it would be outbid by larger players, such as energy producers and large industry when they entered the scene,<sup>141</sup> the second auction, the first one under the ERF, proved that fear unjustified. The lion's share of carbon-abatement contracts went to farmers and landowners, for agriculture, forestry, and land-use projects.<sup>142</sup> According to news reports, 'big industry, which was expected to take up more of this round of funding, was late with its projects'.<sup>143</sup> About 9 per cent of abatement in this auction was for agricultural projects (excluding vegetation).<sup>144</sup> Thus, under the ERF, the agricultural sector began to increase its share of carbon abatement, compared to the situation under the CFI. The third auction took place in April 2016 and saw a further increase in the share of farmers and landowners.<sup>145</sup> After three auctions, a total of 309 carbon-abatement contracts have been awarded, to deliver more than 143 Mt CO<sub>2</sub> eq. of abatement.<sup>146</sup>

Moreover, as of May 2016, a total of 630 projects had been registered in the ERF Register,<sup>147</sup> a dramatic increase from December 2014, when only 178 projects had been registered. The following list shows the number of projects per sector:

Vegetation	350
Waste	124
Savanna burning	70
Energy efficiency	36
Agriculture, consisting of:	32
- sequestration grazing lands	17
- methane capture/biogas piggeries	12
- beef cattle herd management	3

<sup>140</sup> Ibid.

<sup>141</sup> Sarina Locke, 'Farms Could be Shut out of Next Emission Reduction Fund Auction Given Big Corporates will be Competing', *ABC Rural News*, 27 April 2015, <<http://www.abc.net.au/news/2015-04-27/carbon-farming-auction-good-start-to-reducing-emissions/6418792>> (last accessed on 29 August 2016).

<sup>142</sup> Sarina Locke, 'Landholders the Biggest Winners in \$550 Million Carbon Abatement Auction', *ABC Rural New* (13 November 2015), <<http://www.abc.net.au/news/2015-11-12/landholders-biggest-winners-in-carbon-abatement-auction/6935968>> (last accessed on 29 August 2016). Details of the auction results are available on the CER's website <http://www.cleanenergyregulator.gov.au/ERF/Auctions-results>.

<sup>143</sup> Ibid. Industrial projects received 12% of all funding (AU\$ 69m).

<sup>144</sup> As is shown at the CER's website <<http://www.cleanenergyregulator.gov.au/ERF/Auctions-results/November-2015>> (last accessed on 29 August 2016).

<sup>145</sup> According to the CER's website, <<http://www.cleanenergyregulator.gov.au/ERF/Auctions-results/april-2016>> (last accessed on 29 August 2016).

<sup>146</sup> Ibid.

<sup>147</sup> See <<http://www.cleanenergyregulator.gov.au/ERF/project-and-contracts-registers/project-register>> (accessed on 26 May 2016).

Industrial fugitives	10
Transport	8

It is important to reiterate that farmers have been frequently involved in projects that appear under categories other than agriculture, especially vegetation and savanna burning (these being fire-management measures to reduce the risk of wildfires). It is estimated that the majority of the vegetation projects and savanna burning projects, which achieve an abatement of 98.5 and 8 Mt CO<sub>2</sub> eq., respectively, occur on farmland, with the revenue going to farming businesses.<sup>148</sup>

#### 4.2.2. Illustrative CFI/ERF Projects Run by Farmers

To get a better idea of the kind of on-farm project that has been successful under the ERF, a few case-study examples will be discussed here.

##### 4.2.2.1. Methane Capture in Piggeries

An intensive pig farm in Victoria, with 12,000 pigs, on 2,000 acres, and with fifteen staff, received a carbon-abatement contract in April 2015 for the capture of biogas generated from the decomposition of the piggery manure in biodigester-style anaerobic lagoons and the combustion of the methane component of the biogas. The owner of this piggery sees himself as an innovator. Since the early 1980s, he has been introducing new technologies and spends AU\$300,000 (US\$229,630) per year on capital works, including farm improvements, continuously trying to improve production to meet health-and-safety and environmental standards.<sup>149</sup> The organization has been highly automated and uses written procedures for its staff. It has received Quality Assurance Accreditation, a voluntary certification scheme by Australia Pork, which focuses on animal welfare and food safety. The sector is well aware of the negative environmental impacts of pig farming. The main environmental issues are the odour and dealing with large quantities of effluent.<sup>150</sup> Reducing odour was achieved by modifying the design of the sheds. Piggery manure effluent was dealt with by installing technologies to capture methane from the waste and convert it into biogas, and to re-use the waste digestate as organic fertilizer. It is the latter project that was contracted under the ERF. The project is relevant to three environmental problems: methane emissions are reduced (the effluent treatment and recycling system used at the farm has resulted in an 81-per-cent reduction in emissions at the site),<sup>151</sup> renewable energy is generated, displacing fossil fuels used for heating and power generation, and a significant reduction in odour is achieved.<sup>152</sup> The total number of ACCUs issued for 2014/15 and 2015/16 was 18,590, i.e. an abatement of 9,290 t CO<sub>2</sub> eq. per annum.

<sup>148</sup> Interview with Clean Energy Regulator representatives, 10 May 2016.

<sup>149</sup> Lyndal Thorburn and John Langdale, *Embracing Change. Case Studies on How Australian Firms Use Incremental Innovation to Support Growth* (Sydney, Australia: Macquarie University 2003), at 97.

<sup>150</sup> *Ibid.*, at 98.

<sup>151</sup> Alex Sampson, 'Piggery and Compost Company up for Premier's Sustainability Awards', *Weekly Times*, 30 September 2014, <<http://www.weeklytimesnow.com.au/agribusiness/piggery-and-compost-company-up-for-premiers-sustainability-awards/news-story/70b5b7eef394b48119fd4d93cf6adb80>> (last accessed on 29 August 2016).

<sup>152</sup> Australian Pork, 'Aussie Pork Industry Takes the Lead for a Cleaner Environment' (Media Release 3 May 2015).

#### 4.2.2.2. *Sequestration in Grazing Land*

An organic cattle farm in Queensland registered a project in October 2015 aimed at removing CO<sub>2</sub> from the atmosphere by sequestering carbon in its soil-grazing system. The farm uses a targeted method of rotational grazing, moving cattle to paddocks as soon as the grass stops growing, allowing the cattle to graze in it and start the growth process again, thus accelerating the increase of carbon uptake.<sup>153</sup> This particular farmer was involved in developing the methodology in association with Central Queensland University;<sup>154</sup> he is also the chairman of Healthy Soils Inc. Landcare, an organization that ‘conducts research on farm trials and other methodologies to assist landholders, farmers and graziers to improve long term viability meanwhile reducing their reliance on chemicals; thus, reducing soil degradation and erosion’.<sup>155</sup> Another example of the same method is a sequestration project in New South Wales, also registered in October 2015. It is part of a bigger on-farm innovation project which began in 2002; it includes the construction of leaky weirs and swales to slow water flow.<sup>156</sup> This has increased soil moisture and vegetation growth. Targeted grazing has increased soil organic matter and encouraged regeneration of native grasses. Both grazing and the number of livestock present fluctuate with the carrying capacity of the area. Next to the mitigation achieved, the latter project has led to remarkable co-benefits, such as a 250-per-cent increase in stock-carrying capacity, a 15-to-23-per-cent profit margin on cattle production, a constant river outflow regardless of inflow, improved landscape hydrology, and increased native biodiversity.<sup>157</sup> By June 2016, these two projects, while registered, had not yet received a contract.

#### 4.2.2.3. *Reforestation by Mallee Plantings*

Typical for the south of Western Australia are reforestation projects involving the planting and management of mallee trees (a vegetation group that occurs in semi-arid areas of southern Australia) on agricultural land both to store carbon and to stop degradation and salinization of farmland. It is a good example of a measure that achieves both mitigation and adaptation simultaneously. The mallee oil, harvested from the trees, can be sold as a biofuel. So far, lack of investment in oil and in mallee-oil-powered biomass generators is preventing large-scale biofuel production from mallee.<sup>158</sup> These projects have a twenty-five-year permanence period and were registered as eligible projects under the ERF in April 2015 by a Sydney-based carbon

<sup>153</sup> Rachel Conaghan, ‘Soil Test Breaks Vital Ground’, *Rural Weekly*, 27 March 2015, <<http://www.ruralweekly.com.au/news/soil-test-breaks-vital-ground/2585983/>> (last accessed on 29 August 2016).

<sup>154</sup> Ibid.; CQUni, ‘CQUni Researchers Involved in Healthy Soils Field’ (Media Release, 22 July 2014).

<sup>155</sup> See the Healthy Soils Inc. website, <<http://www.healthysouils.org.au>> (last accessed on 29 August 2016).

<sup>156</sup> Soils for Life, *Case study. Innovations for Regenerative Landscape Management Project* (Fairbairn, Australia: Outcomes Australia, 2012), at 128-35.

<sup>157</sup> Ibid. With such co-benefits, questions arise as to the role of the ERF (Is the ERF the real push factor for the changes in agricultural practices? What is the additionality? What is the role of public funding?). These questions will be discussed in the next section below.

<sup>158</sup> Sean Murphy, ‘Mallee Oil’, *ABC TV Broadcast*, 22 June 2014, <<http://www.abc.net.au/landline/content/2014/s4030485.htm>> (last accessed on 29 August 2016).



agent on behalf of local farmers in Western Australia. One was granted a carbon abatement contract by the CER under the ERF in April 2015. No ACCUs had been issued as of 1 June 2016.

#### *4.2.2.4. Avoided Deforestation*

A project in New South Wales under the avoided-deforestation methodology involves the protection of 8,500 hectares of native forest through the prevention of clearing and clear-felling harvesting activities. The farmer in this case had already received a permit to clear trees for grazing land. Under the project, the farmer manages the forest for protection over a 100-year period. Management includes installing fire breaks around the forest to prevent bushfire damage. This project was jointly developed by two carbon agents and leads to an additional revenue stream for the farmer, which is especially important considering that his property is located in a drought-prone area.<sup>159</sup> A contract was awarded under the ERF in April 2015, with a total of 238,828 ACCUs issued. The project has a permanence obligation until 6 June 2114. A similar case under the avoided-deforestation method involves the protection of 7,000 hectares of dry native forest on farmland as part of a bigger on-farm project to drought-proof the land. This project was contracted in April 2015 and received 252,681 ACCUs. The money raised from the ERF was used to buy another property and put on new workers.<sup>160</sup> A carbon agent assists the farmer with the administrative work; in return, the agent takes a cut of the carbon credits.<sup>161</sup>

### ***4.3. Stakeholders' Experiences with Carbon Farming in Australia***

#### **4.3.1. Farmers' Motivation to Run Projects Under the CFI/ERF**

##### *4.3.1.1. Slow Start, Growing Interest, and Attitude Change*

In the course of the interviews, all respondents agreed that the CFI, and especially the ERF, has changed and still is changing the attitudes of farmers towards climate-smart agriculture. Carbon agents, representatives of farmers' organizations and of financial institutions, all stressed that the farming sector, generally, is very conservative. Farmers tend to stick to traditional work methods and have a negative attitude towards environmental and climate policies, as these may interfere with their preferred agricultural practices. 'Farmers felt that carbon was a bad thing that would only cost them money.' It took years of convincing by the government and by project developers to get farmers interested. In the early years, the CFI was pushed by carbon agents or 'aggregators'. The carbon agents developed methodologies, lobbied with the government to get them recognized in law, developed projects, and knocked on farmers' doors to persuade them to implement them. The farmers' organizations were quite

<sup>159</sup> Anonymous, 'Forest Project Gets Approval', *Narromine News Online*, 29 January 2014, <<http://www.narrominenewsonline.com.au/story/2053451/forest-project-gets-approval/>> (last accessed on 29 August 2016).

<sup>160</sup> Tom Arup, 'Wide, Brown Land Becomes a Home to Carbon Farming', *Sydney Morning Herald*, 17 August 2014, <<http://www.smh.com.au/national/wide-brown-land-becomes-a-home-to-carbon-farming-20140816-104t0v.html>> (last accessed on 29 August 2016).

<sup>161</sup> Ibid.

reluctant to be engaged, with the exception of Australia Pork. This lobby group for the piggery industry had a methodology developed and accepted by the government and persuaded its members to implement it. Thus, in the pork sector, the sector's organization played the role of carbon agents in other sectors. In the beginning, it was mainly those farmers who are always interested in improving environmental performance who became engaged, as well as big farms that were approached by aggregators. According to a representative from a major farmers' organization, those in the latter category were often desperate farmers in areas struck by drought, such as in western New South Wales. They were desperate for cash; for some of them, the prospect of twenty-five years of income was the only way out.

After a few years of experience with the CFI/ERF, farmers are increasingly realizing that they can make money through carbon projects. A carbon agent said that a familiar, somewhat ironic, phrase among consultants involved with farmers is that 'you can get an idea in a farmer's head only through a cheque book'. It is generally felt that the price certainty offered by the ERF has had the biggest influence on farmers' participation rates. As indicated above, the data indeed show a large jump in the number of registered projects after the introduction of the ERF, a jump that surprised many (see section 4.3.3, below). Carbon agents have noticed that farmers have begun to approach them, instead of the other way around. It should also be stressed, though, that the vast majority of farmers currently are not engaged in ERF projects.

#### *4.3.1.2. An Aging Sector*

Most respondents referred to the fact that those working in the agricultural sector in Australia are aging. Several respondents pointed out that the average age of a farmer is 57-58 years, and 99 per cent of the farms are family businesses.<sup>162</sup> The sector is facing a transition to a younger generation. Often, there are no children who want to take over a farm, in which case farmers must find a buyer. As a consequence, many farmers are only interested in securing sufficient income for the next ten years or so, and do not look further ahead. The additional income from the ERF allows this group of farmers to have a smoother generational transition. The CFI/ERF assists in the diversification of agricultural practices and in succession planning. It allows, for instance, a farmer to buy land from the aging farmer next door, using funds generated through vegetation projects under the CFI/ERF on the newly acquired land.

It was also generally felt that the older generation of farmers is much more reluctant to move towards sustainable or climate-smart farming than the younger generation. This indicates that there should be a growth in potential for climate-smart agriculture after the transition to the next generation.

<sup>162</sup> Data on the number of family owned farms are consistent, see National Farmers' Federation, *NFF Farm Facts: 2012* (Kingston, Australia: National Farmers' Federation, 2012) at 5-6, as well as the Nexus Commonwealth of Nations Network website on agriculture in Australia, <<http://www.commonwealthofnations.org/sectors-australia/business/agriculture/>> (last accessed on 29 August 2016). The average age is more difficult to establish, see *ibid.*, at 6 (52 years), and Victorian Farmers Federation, 'Inquiry into the Capacity of the Farming Sector to Attract and Retain Young Farmers and Respond to an Ageing Workforce' (Melbourne, Australia: Victorian Farmers Federation, 2011) at 3 (between 53 and 59).

Banks are aware of the problem of aging and are looking for financial solutions to achieve a smooth transition to younger farmers. Integration of farms is financially challenging, as it leads to larger farms and a larger financial burden on young farmers. The new generation often also has to buy out brothers or sisters who do not want to be involved in farming. One respondent indicated that his bank is in the process of developing a financial product that helps a young farmer to buy up land from an older farmer by offering him or her a longer period of financing. The bank would remain involved for five years, as would the older farmer. In this way, the bank offers the younger farmer long-term financial security, while the older farmer stays involved in the land (which is deemed important from a social perspective).

#### *4.3.1.3. Small Farms*

In the early years of the CFI, only large farms were targeted by the carbon agents. Respondents mentioned several reasons for that. At the start, there was a lot of uncertainty about whether the CFI was going to work and be economically viable for farmers. Also, there were implementation issues. The high level of complexity implied an involvement of large farms, which could take risks and deal with the complexity. Soil-carbon measures, for example, need to be implemented for three years before one can claim ACCUs. This requires an upfront investment that small farms cannot easily take. The transaction costs are considered high, and legal issues connected to the CFI/ERF can be difficult (due not only to the complexity of the scheme but to wider legal circumstances such as the existence of 'native title' on agricultural property, i.e. aboriginal land-use rights). Another important reason for the involvement of primarily large farms is the fact that larger volumes of abatement can be achieved on them, which is more profitable for consultants.

How to involve the majority of farms in Australia, which are relatively small family businesses?<sup>163</sup> Carbon agents can aggregate small-farm projects into one large project. With the introduction of the ERF, aggregation has been the government's specific policy.<sup>164</sup> CER respondents indicated that this was a successful policy change. A handful of large aggregators are very active under the ERF, especially with vegetation projects. Sometimes landowners are the project proponents, helped by the aggregators; in other cases, the aggregators themselves are the proponents. This decreases the administrative burden and fixed costs for smaller farms. Some respondents, both agribusiness representatives and carbon agents, said that aggregation has a risk: it is much more difficult to manage an aggregated project, because one must make sure that all farmers involved comply with the rules. If one farmer does not comply, the whole project is jeopardized. Partly in order to avoid this risk, smaller farms are now becoming involved individually as well. Since there is presently more expertise, and processes have become more automated, there are fewer overhead costs and risks. Moreover, better methodologies could increase the level of abatement on smaller farms and thus contribute to greater participation by smaller farms.<sup>165</sup>

<sup>163</sup> Similarly, Climate Change Authority, *supra* note 9, at 304.

<sup>164</sup> Following the suggestion made by Climate Change Authority, *ibid*.

<sup>165</sup> The Climate Change Authority recommended to simplify methodologies to increase participation by small farms, *ibid*.

Farmers' organizations' representatives added: 'Aggregation is expensive and the risks usually are not with the aggregators but with the land holders. For small farms, the costs of aggregation are too big.' To engage the vast majority of relatively small farms, they suggested a 'whole of farm approach'. When a relatively small farm wants to reduce greenhouse gas emissions, the most effective way, they said, is to introduce a range of measures across the farm that together lead to a reduction in emissions. Under the current scheme, however, the farmer must have, e.g., three separate projects under different methods with all the administration and overheads that go with that. He or she may have to deal with more than one aggregator, which is costly as well. Having a balance of different methodologies on one farm, according to one respondent, is a way to generate more abatement and more income from the ERF. A 'whole of farm approach' also reduces risks: if one method does not work in the long run, the farmer can intensify other methods to achieve the same overall reductions.

#### 4.3.2. The Role of Consultants

Consultants (carbon agents, aggregators) have promoted the scheme from the start. They developed the most successful methodologies. The avoided-deforestation methodology, for instance, was seen through by two firms. These firms invested much time and money into the development of the methodologies without the certainty that they would be adopted by the government. In interviews, they noted that they took risks, but were ultimately successful, and now earn part of their income from the avoided-deforestation projects on the farmland they supervise. Another firm has been especially active with the mallee-oil and soil-carbon methodologies. Thus, carbon agents target certain types of project. They promote 'their' methodology with farmers and largely take over the application, monitoring, reporting, and auditing work from the farmers, in exchange for a portion of the ERF or private-carbon-market income. Some even provide upfront finance for the farmer to initiate the project. Different carbon agents operate under different financial arrangements, but overall it seems that around 30 per cent of the funds generated go to the consultants.

While most carbon agents are based in large cities (and then mostly in Sydney), some have rural roots. Some are quite small and outsource most of the work to local consultants in the area where the projects are being set up, while others have a large (30+) staff and do all the work themselves. The more complex legal work, such as drafting contracts in complex situations, including financial contracts with lenders, is often outsourced to legal advisors at law firms or legal consultants.

The only sector in which consultants have not dominated' seems to be the piggery sector with its methane-to-biogas projects. Here, it was Australia Pork that led development of the methodology and encouraged its members to implement it and apply for ERF funds. In this sector, farmers do the monitoring and reporting themselves without the help of consultants. Once the technology has been installed and is working, monitoring is fairly easy as it is largely automated. The external auditor tells the farmer what to monitor and provides assistance if needed.

All respondents were positive about the consultants: ‘They are needed and do a lot of good work.’ Respondents from the CER and Department of the Environment stressed the need to have economies of scale: ‘Aggregators are needed in order to make a policy scheme work, in order to get individuals to apply. It has always been a government policy to facilitate the creation of such companies so as to aggregate the implementation of policy goals.’

Aggregation works both ways: in the direction of the farmers and in the direction of the competent authority. The authorities deal with a relatively small number of knowledgeable aggregators. In the interviews, government officials acknowledged that the success of the ERF is largely due to the efforts of the carbon agents and their aggregation efforts: ‘Without them, participation in the scheme would have been much lower, and abatement would have been tiny.’

Several respondents indicated that there are two ways in which the integrity of the consultants is checked. The carbon agents must have a financial-services license (under corporate law). The CFI Act has the fit-and-proper person test, which allows the CER to assess the integrity of the aggregators when they register a project, and ‘to knock them out of the scheme if they breach the law’, to quote one of the representatives of the CER.

#### 4.3.3. CFI v. ERF: Carbon Market or Fixed Price

All stakeholders maintained that the transition from the CFI to the ERF gave an enormous boost to the scheme. Under the CFI, everyone had a low price expectation because of policy uncertainty and because offsets for industry could cover only five per cent of allowances.<sup>166</sup> Now, under the ERF, farmers receive long-term contracts (mostly for ten years), with a guaranteed income stream. This is considered important by Australian farmers, who often face droughts, floods, and fluctuating markets. It also makes it easier for them to negotiate with the banks when seeking funding. The CER emphasized that the government offers farmers commercially fair and balanced contracts. For example, they take bushfire risks into account, and carbon contracts do not have the ‘termination for convenience clause’ that government contracts usually have (and which allows successive governments to end a contract concluded by a previous government). This is aimed at ensuring that farmers get a fair contract with a ten-year certainty.

The carbon agents interviewed saw the price certainty as the main reason for the success of the ERF. ‘Farmers want to know what they will get paid. Under the CFI, we could not give them a price guarantee. Now we can. This allows service providers to step in and develop projects.’ Another carbon agent said:

Thanks to the ERF this has become commercially viable. A huge increase in the number of projects and the amount of abatement is achieved, much more abatement than ever anticipated. I think the ERF is a huge success. It has pushed the whole process: projects were developed, implemented, monitored, which leads, step by step, to more knowledge,

<sup>166</sup> This also was one the main conclusions of the Climate Change Authority’s review, *supra* note 110, at 3.

farmers gradually step up mitigation and adaptation measures, the whole sector is learning and changing. We need the land sector for mitigation and adaptation. This is kick-starting that process because it leads to revenue for farmers and service providers.

The repeal of the ETS and the introduction of abatement contracts under the ERF did not put an end to the sale of ACCUs to private-market parties. Private companies such as Santos (an Australian oil and gas company) and the Australian airline Qantas still buy farm-generated ACCUs for their private offset programmes.

However, there are some concerns about the ERF, especially in relation to the open auction market. It is still feared—even though the fears have not been realized—that farmers cannot compete with big industries and energy producers with a lot of capital. A respondent from an agribusiness organization suggested introducing a partitioning of the budget so that part always goes to agricultural projects.

#### 4.3.4. Funding Project Investments

The issue of the financing gap was referred to in section 3.2.2.4: farmers must invest in a project before they can generate emission reductions, and only then sell them to the government under the ERF. The CER interviewees indicated that it was a deliberate policy decision to grant payment after the delivery of abatement. The huge increase in the number of registered projects since the start of the ERF indicates, according to the CER, that the financing gap is not a significant issue.

Other respondents saw the financing gap as a limitation for most project types. In the piggeries sector, producers have to buy and install methane-capture and biogas-production technologies. It was said that, in the pork sector, small- and medium-size farms, especially, need kick-start funding. As the agricultural sector is not eligible for the government's subsidy scheme to promote renewable-energy technology (ARENA),<sup>167</sup> farmers have to seek loans from banks—either small, niche, banks, such as the Clean Energy Finance Corporation,<sup>168</sup> or, more commonly, the farmer's home bank. Sequestration projects also have upfront costs: they have an impact on farming activity, they take time, and need investment in compost, recycled soil amendments, and soil additives. Only grazing management has no major upfront costs, for such projects usually involve the introduction of a different grazing management, or destocking, or setting aside of land. Carbon agents get paid only after ERF income is received. According to the agents, this is necessary, or the scheme would be unaffordable to farmers. As already indicated, sometimes aggregators finance not only their own upfront costs but also those of farmers, ahead of the issuance of ACCUs.

<sup>167</sup> The Australian Renewable Energy Agency's (ARENA) subsidy programme is primarily aimed at the energy sector and has as its main aims improving the competitiveness of renewable energy technologies and increasing the supply of renewable energy in Australia, see <<http://arena.gov.au/funding/>> (last visited on 29 August 2016).

<sup>168</sup> The Clean Energy Finance Corporation (CEFC) is a commercial investment organization, created by the Australian government under the Clean Energy Finance Corporation Act 2012. It invests in projects concerning renewable energy, energy efficiency and low emissions technologies, including in the agricultural sector, see <<http://www.cleanenergyfinancecorp.com.au/energy-efficiency/agriculture.aspx>> (last visited on 29 August 2016).

An agribusiness organization's representative indicated that there is a strong reluctance among banks to provide approval for sequestration projects. Banks that have mortgages on land turn down sequestration projects because they think it is too risky to have such a long-term commitment on the land. For some methodologies, a trade-off is thought to exist between the carbon enterprise and agricultural productivity. That is undesirable, not just for farmers, but for financiers as well.

One bank made the national media because it turned down two financing propositions from farmers who had ERF projects.<sup>169</sup> In this case, the bank rejected the proposals because the overall financial situation of the applicant farmers was bad. For them, the ERF was the only profitable activity—an escape from bad business. The bank's respondent said: 'We want to finance strong sustainable businesses, that do CFI/ERF projects to diversify their activities, but that have a good product on the food and fibre market as well.' A respondent for a major agribusiness organization made a similar point: 'for some drought-struck farms, the ERF is the only hope. That, however, is not deemed sustainable.'

Carbon farming, therefore, is not looked upon by banks in isolation, but as an element of a broader transition towards sustainability. Thus some banks have developed a financial product offering favourable financing conditions to farmers who want to change to sustainable agriculture, not focusing just on carbon, but on a range of different indicators (e.g. waste management, recycling, improved irrigation and soil management, animal welfare etc.). All respondents mentioned the often substantial co-benefits for farmers who are engaged in carbon-farming projects, such as energy savings, greater water retention, improved soil quality, and reversal of salination or erosion. Often these co-benefits offer an additional incentive for farmers (see, further, section 4.3.7, below).

#### 4.3.5. Administration and Compliance

##### 4.3.5.1. Competent Authority's Perspective

When asked about the integrity of the scheme, the interviewees at the CER stressed that one has to look at the whole scheme, from project registration to auditing and accreditation. They said that there are four phases prior to a project's commencement: project registration; auction qualification; auction registration; and auction. The CER carries out a risk-based check at the registration phase. The 'fit and proper person test' is an important instrument to ensure integrity: 'Who are we dealing with? What have been this person's activities in the past?'

After the auction, there are again several stages at which integrity is checked. First, in the contract phase, the CER can set 'condition precedent', for instance that payment is subject to local government planning approval for the project, or subject to finding finance to cover the project. The CER respondents indicated that the CER purchases between fifty and a hundred per cent of abatement, so there is some room for caution:

<sup>169</sup> See for instance, Sue Neales, 'Heartache as Carbon Credits Turn to Debt', *Weekly Times*, 20 May 2014, <<http://www.weeklytimesnow.com.au/news/national/heartache-as-carbon-credits-turn-to-debt/story-fnkfnsp-1226923533045>> (last visited on 29 August 2016).

they can decide to only buy part of the expected abatement when there is doubt about the reliability of the claim. This does not imply that the CER issues contracts to projects it has doubts about. It simply is not always possible to predict exactly how much abatement will actually be achieved in the entire project from start to finish, as this is also dependent on unpredictable variables such as weather conditions.

Then there is the auditing phase. The CER relies heavily on the audit reports. Under the CFI, an audit was needed for every report/claim for credits. Under the ERF, it was decided to reduce this burden. The current scheme requires a minimum of three audits. According to the CER respondents, this is sufficient to check the integrity of the abatement. It was an explicit policy decision aimed at achieving deregulation. Fewer than three audits would not be desirable, according to the respondents. All respondents were positive about the role of the auditors and felt that the CER can rely on the audits: 'The auditors are good, and they are audited as well. They are sometimes pushed to go into a certain direction, but they depend on their reputation. We do not see any scandals.' According to the CER interviewees, irregularities were found, but not many. The CER does not believe that any fraudulent projects exist. Mostly, irregularities are caused by genuine mistakes. Non-compliance is expected to remain low: 'We are seeing early delivery of abatement instead of non- or late abatement. That is a good sign.' To date, no sanctions have been imposed.

The CER, which is responsible for the whole process, from process registration through auctioning to monitoring and enforcement, is a relatively small organization. It is able to manage the entire process because as a process it is streamlined and mostly automated. For example, only a few days after an auction the CER is able to announce which projects have won a contract. It can do this because it only looks at price and abatement: the projects that have the most abatement against the lowest costs. The CER does not assess the overall quality of individual projects at the auctioning phase.

#### *4.3.5.2. Farmers' Perspective*

Generally, respondents thought that the monitoring and reporting requirements in the various methodologies are too complex to be carried out by farmers themselves. As indicated above, the methodologies for piggeries are an exception because of the ease of electronic monitoring. As a consequence, audit costs are also much lower than in other sectors. By contrast, for example, in the methodology for soil carbon samples must be taken at multiple locations, at specified depths, at regular intervals, and by certified researchers. All respondents indicated that these more complex monitoring and reporting requirements are manageable, but that farmers need help from their carbon agents to comply with them. As a consequence, carbon agents work with their clients throughout the entire project. As one carbon agent put it: 'We are in a long term relationship with our clients, as these contracts run for ten years. That is why the relationship gets very personal.'

In 2014, the Climate Change Authority argued that the administrative burden is difficult to reduce: agricultural emissions are difficult to regulate, and hence transaction costs for



this sector will remain unavoidably high.<sup>170</sup> Complicated methods are needed to ensure that abatement is real and additional. High levels of local variability make it challenging to measure and verify emission reductions in natural systems. ‘These challenges are exacerbated where projects only achieve a small quantity of emission reductions, as transaction costs can become high on a per tonne CO<sub>2</sub>-e basis.’<sup>171</sup>

A respondent from a farmers’ organization acknowledged these findings: ‘the administrative burden is too big and too costly for a lot of people’. The respondent stressed the need to streamline the administration by using automated devices, tracking devices, digitized reporting, etc. This would make the process easier for farmers as well as for the government, as the authorities could then link project systems to their own automated reporting systems: ‘There still is a lot of work to do to streamline and digitalize back-end processes.’

Everyone interviewed stressed that the strict rules on registration, monitoring, reporting, and auditing are essential for the success of the scheme. These rules have led to a high degree of integrity and reliability.<sup>172</sup> Carbon agents all acknowledged that the thorough and involved processes in the various stages (registration, monitoring and reporting, auditing) lead to high overhead costs for all those involved, including the government. This, however, is the price that needs to be paid to have a reliable scheme under which large amounts of public money are spent.

#### 4.3.6. Scope of the Projects: Aim of Methods

##### *4.3.6.1. Development of Methodology Determinations for the Agricultural Sector*

Methodology development was driven by demand and political preference. Respondents indicated that methane capture from piggeries was a method for which there was high sector demand. Savanna burning was an important methodology because politicians wanted to favour aboriginal communities (one-third of savanna burning is done by aboriginal groups on native title land).

Respondents at the CER said that most projects under the ERF are run by farmers, albeit mostly in the vegetation category, with only a small percentage in the agriculture category. Since there are nine methodologies in the agriculture category, more agricultural (i.e., non-vegetation) projects had been expected to be taken up: ‘It is, however, the market that decides. We have the methods; it is up to the market to propose projects.’ The reason why piggeries score well in the agriculture category is that in biogas projects the additionality is relatively clear, reductions are easy to monitor and measure, and they generate good side-benefits (lower energy bills and additional revenue through delivery of surplus energy to the grid). Australia Pork’s respondent explained how they found a low-cost biogas technology in New Zealand, how they promoted the adoption of that technology by their members, and then promoted the adoption of a CFI-methodology around that technology by the government, so as to achieve a sector wide goal of emitting one kg CO<sub>2</sub> per one kg of pork produced.

<sup>170</sup> Climate Change Authority, *supra* note 110, at 46.

<sup>171</sup> *Ibid.*

<sup>172</sup> In 2014, the Climate Change Authority reached the same conclusion, *ibid.*, at 2.

It is generally thought, however, that there are numerous other agricultural activities for which methodologies could be developed. Several respondents indicated their concern that this is not happening at the moment due to a lack of initiative in the sector. A respondent from a large farmers' organization indicated that most attention has been focused on the early methods that make commercial sense. More methods are needed in order to achieve a larger degree of participation of Australia's farmers. Reducing methane emissions from cattle was mentioned as an example where there currently is only one methodology (piggeries), but where others, aimed at better feed conversion, are in the pipeline which are promising and that can be made available in the next three to five years, such as genetic selection and changing the gut bacteria in cattle.

As already stated, most projects are in the category of vegetation. Vegetation projects generally are on farmland and are mostly proposed by a handful of aggregators. One of these aggregators estimated that of all savanna burning, vegetation-regeneration, revegetation, and soil-carbon projects, 300 to 400 (the vast majority of these projects) are on farmland.

There are mixed thoughts about the innovative character of the various methodologies. According to several carbon agents and a climate change NGO, some methodologies are thought to be too conservative, aiming at introducing technologies that farmers should introduce anyway. This may be particularly true for methodologies that were proposed by the specific sector organization, rather than by the government or by carbon agents. There is also a timing issue: a new technology that was stimulated by the CFI, over time comes into common use. Biogas production in piggeries was mentioned both by carbon agents, a representative of a climate change NGO and by a former high official of the Australian government as an example: 'Piggery farms make a lot of money by producing energy from methane, they do not need a government subsidy. Many piggeries have converted to this already simply because of economic reasons, not because of the ERF.'

Other methodologies, however, are very new. All carbon agents interviewed considered these to be somewhat risky because, at the time of adoption of the methodology, it was not entirely clear how much abatement would be generated, or whether abatement would be generated at all when applying the methodology in a range of different local circumstances across Australia. One carbon agent estimated that perhaps twenty per cent of the projects do not generate the level of abatement that was expected when the methodology was adopted: 'You can criticize this for not being perfect. But this was a good choice, because at least things could get started. While monitoring, we are learning.' Several carbon agents mentioned soil carbon as a very promising methodology for the future that is being pushed by the ERF. They praise the government for having taken the risk of adopting a methodology of which the additionality had not been fully proven. They argue that innovation has been forced and that the continuous monitoring process leads to an improved methodology that is potentially valuable for the whole world.

#### *4.3.6.2. Mitigation or Climate-Smart Agriculture?*

The CER respondents were very clear about the goal of the ERF:

The ERF's aim is to achieve abatement at the lowest cost, it is not a grant scheme aimed at technology investment support. We have other programmes for that. It was an explicit decision to get abatement at the lowest cost. The rest is collateral. Decisions are taken purely on price. In an auction, we do not even see the projects. We only see the price and the amount of abatement, so the nature of the projects does not play a role.

Other respondents stressed that adaptation is essential for Australia's farming sector, a vital element of any sustainable farming business. Several sequestration methodologies have strong positive adaptation side effects, as they increase the resilience of the land and lead to greater efficiency. Interviewees said that increasing soil carbon is a good example of how mitigation and adaptation go hand-in-hand. Many argued for the adoption of more methodologies that have co-benefits in the area of adaptation. They felt that adaptation should play a larger role under the ERF in the future, and that the ERF should not focus on mitigation alone (see, further, section 4.3.8).

#### 4.3.7. Results of CFI/ERF for the Environment and for the Individual Farmer

In literature, the repeal of the Clean Energy Act and the transition from the CFI to the ERF has been criticized for a lack of ambition to achieve major cuts in GHG emissions.<sup>173</sup> Yet this policy change did have a very positive impact on promoting carbon farming. Everyone interviewed considered the ERF a great success, at least for the agricultural sector. Abatement has been primarily achieved by vegetation projects. There is no evidence that these projects would have happened otherwise. The financial incentives offered by the CFI and ERF are considered to be largely responsible for the large abatement that has been achieved in this sector. Contrary to a recent report that argues that many 'anyway'-projects are accepted under the ERF,<sup>174</sup> i.e. projects that would have occurred anyway, I found no clear evidence of this in the interviews, perhaps with the exception of some (but not all) methane conversion projects in piggeries. As already mentioned, in the piggeries sector, some producers save AU\$15,000 (roughly US\$11,500) per month on energy bills, and earn an additional AU\$15,000 for delivering energy to the grid after having adopted methane-capture and biogas-production technology. When asked whether the CFI/ERF or the expected economic co-benefit was the greatest attraction, the respondent from the pork sector said that the CFI/ERF was the main driver for the distribution of this technology:

About half of the participating producers were pushed by the CFI/ERF. It especially pushes medium sized producers, because it increases their payback just enough to get involved.

<sup>173</sup> Climate Change Authority, *supra* note 9, at 8 and 10 (albeit rather implicitly); Marcia Rocha, Bill Hare, Paola Parra, Jasmin Cantzler, Niklas Höhne, Louise Jeffery, Ryan Alexander, Lindee Wong, Karlien Wouters and Kornelis Blok, *Australia Set to Overshoot its 2030 Target by Large Margin* (Climate Action Tracker, Climate Analytics, 2015) at 12.

<sup>174</sup> Paul J. Burke, 'Undermined by Adverse Selection: Australia's Direct Action Abatement Subsidies' (Working Paper Series No. 1605, Centre for Climate Economics & Policy, Australian National University, 2016). This paper assumes, based on literature research, that by using an automated system when selecting projects under an ERF auction that only focuses on achieving the most abatement at the lowest cost, cheap and simple projects are favoured.

Some carbon agents, however, suggested that these large extra earnings in the piggeries sector take away the need for the government to finance the adoption of methane capture technologies through the ERF. It indeed seems that over time, continued support for mitigation technologies should be reviewed. Once regular market incentives become strong enough for farmers to adopt new technologies anyway, government funds can better be directed to stimulate the adoption of innovative technologies or practices that need an extra push.

Continued support for methodologies also needs to be reviewed in the light of negative side effects on the environment. Several respondents, both from carbon agents and the agricultural sector, indicated that some methodologies, such as oil mallee plantings, have detrimental impacts on biodiversity. When such negative side effects are discovered, it seems appropriate for the government to end its support for that methodology under a carbon farming scheme.

Generally, respondents heralded the generation of new knowledge for the farming sector through the ERF. They felt that several methodologies, such as soil-carbon methodologies, truly foster innovation. Thanks to the ERF, better farming methods are introduced in a generally conservative sector. These methods are not just good for combatting climate change, they have many benefits for farmers and even for food security. Vegetation projects generally reduce salination and erosion and improve water retention. Soil-carbon projects were described as having an astonishing impact on soil quality. One carbon agent maintained that every one-per-cent increase in the level of soil organic carbon leads to an increase of 14.4 litres of plant water availability per square metre in the top thirty centimetres of soil.<sup>175</sup> Assessing the impact of soil-carbon projects, however, is complex, and carbon agents indicated that ‘we are still learning how to do it under different circumstances’. Since the ERF requires farmers to carefully monitor what is happening in the soil, more data will gradually become available on the impacts of the increase of soil carbon on the productivity of the soil.

#### 4.3.8. Future Production Increase and Additional Emission Cuts: What Role for CFI/ERF?

##### 4.3.8.1. *Financing Carbon Farming: Private Carbon Market or Government Scheme?*

There is considerable debate about the future of Australia’s climate policy and the role of the CFI/ERF as part of that policy.<sup>176</sup> The interviews were held only one month before the 2016 national elections. Most respondents mentioned as important the adoption of the Paris Agreement, which necessitates a more ambitious climate policy for Australia, and the expected dramatic increase in demand for food products from

<sup>175</sup> I could not find confirmation of these figures, but the literature does confirm that increasing soil carbon greatly improves plant water availability. See section 2, above, and the references in note 45.

<sup>176</sup> E.g., Gabrielle Chan, ‘Election 2016: Turnbull Tells Leaders’ Debate He Will Meet Tough Climate Change Targets’, *The Guardian*, 29 May 2016, <<http://www.theguardian.com/australia-news/2016/may/29/election-2016-turnbull-tells-leaders-debate-he-will-meet-tough-climate-change-targets>> (last accessed on 29 August 2016).

Asia. These developments necessitate a much stronger focus of climate policy and law on the agricultural sector.

Several respondents thought that an ETS is needed to generate more funds to invest in offsets in agriculture. Funding so many agricultural emission-reduction projects through government funds is unattainable, they thought. One respondent said: 'We have to go back to the original scheme of the CFI embedded in a market-based cap-and-trade system.' Another consultant stressed that setting a cap on emissions is urgently required:

Otherwise it is a bucket with a hole. It is impossible to know whether emission cuts under the ERF are additional. You have to set a cap and then introduce mechanisms like these, so that you know that overall emissions will go down. We need complimentary policies therefore.

Most carbon agents expected that the Australian government would commit to additional funding for the next few years, with the aim to fund between 2000 and 3000 projects until 2025. All acknowledged that after that, additional measures are required, including setting a cap on agricultural emissions. One respondent from the agricultural business sector complained that increasing competition for diminishing ERF funds may squeeze out farming businesses. He indicated that some farmers already ask themselves 'what's the point in applying?' As far as the near future is concerned, however, the CER interviewees indicated that sufficient funds will be available: 'At the moment [after the April 2016 auction], we have AU\$800 million left. This is sufficient money for many more projects. Whether more money should go into the ERF is a hotly contested policy issue'. These respondents also stressed that projects also go ahead without government funding as ACCUs are still being sold on the regular carbon market.

Several interviewees, both carbon agents and representatives from agricultural organisations, were critical of having an ETS finance carbon farming. They pointed at the current low carbon price and said that farmers need a reliable and stable source of income. A respondent from government and academia added that it is difficult to return to the ETS Australia used to have. This generic instrument was meant to achieve all climate policy goals at once without any additional policy instruments. Instead, a multi instrument scheme is needed that is specifically focused on farmers.

The CER respondents referred to different views in the current public debate, that either argue for tighter safeguards that can partly be met by the use of tradable permits, including offsets from farmers,<sup>177</sup> or for tightening the safeguards after 2020 with emission-intensity benchmarks, to create demand.<sup>178</sup>

<sup>177</sup> Tony Wood, 'Road map Points Way to Stable Climate Policy', Grattan Institute website (11 April 2016), <<https://grattan.edu.au/news/road-map-points-way-to-stable-climate-policy>> (last accessed on 29 August 2016). The Grattan Institute is an independent think tank on Australian public policy.

<sup>178</sup> Greg Hunt, 'Safeguard Mechanism Will Support Emissions Reduction', Media Release (6 April 2016), <<https://www.environment.gov.au/minister/hunt/2016/mr20160406a.html>> and <<https://www.environment.gov.au/climate-change/emissions-reduction-fund/about/safeguard-mechanism>> (last accessed 29 August 2016). Greg Hunt, at that time, was the Minister for the Environment.

#### *4.3.8.2. Broadening the Scheme Beyond Mitigation?*

As stated earlier, most respondents felt that the scheme should not have a sole focus on mitigation, but should be extended to also focus on adaptation, landscape restoration, and biodiversity preservation. There were many opportunities, they said, to rehabilitate farmland. The ERF offers the possibility to integrate these factors. Currently, positive impacts in these areas through the operation of the ERF are unintended by the policy, yet important, co-benefits. A person from one of Australia's major farmers' organizations stressed the importance of having a balanced, integrated approach at farm level, namely several different types of measure at the farm that together form a good balance for mitigation, productivity, biodiversity conservation, etc. All interviewees seemed to agree that broadening the scheme should not reduce its integrity.

#### *4.3.8.3. What About Food Security?*

Carbon farming can have a beneficial impact on food production. Generally, respondents believed that a broader process towards sustainable agriculture is needed to be able to meet increasing demand under increasing climate change impacts. A respondent from a bank said: 'We only support smart farmers who have a good product and who can handle the responsibility of continuous improvement for sustainability and food security.'

To reduce emissions while at the same time increasing production, the focus, according to the respondent of a farmers' organization, should be on reducing the emission intensity of production. This is especially important for the cattle sector, as most of agricultural emissions in Australia are associated with this sector: 'Reduce the emissions per beast. This is a critical part of the story. We need much more R&D to achieve a better feed conversion.' This is in line with earlier findings of the Climate Change Authority that noted that it is likely that emissions from the agricultural sector will grow, even with a high carbon price in place.<sup>179</sup> Although agricultural emissions can be reduced by improved manure management, feed supplement, feedlot finishing, and pasture improvements, the Climate Change Authority found that most of the technologies and practices that would achieve this are still in development and not ready for commercial use.<sup>180</sup>

Most respondents thought the expected increase in food demand from the Asian market could in theory be met by the Australian farming sector. Some increase is possible through better practices on existing farms, but the vast majority of additional food must come from yet-to-be-developed agricultural areas. In the tropical north of Australia, especially, there are areas with good irrigation potential, such as the Pilbara Region. Development of this area is currently being discussed, as is evident from a 2015 White Paper.<sup>181</sup> Through the new Northern Australia Infrastructure Facility Act 2016, the

<sup>179</sup> Climate Change Authority, *supra* note 108, at 54, and Climate Change Authority, *supra* note 9, at 303.

<sup>180</sup> *Ibid.*

<sup>181</sup> Australian Government, 'Our North, Our Future: White Paper on Developing Northern Australia' (Canberra: Commonwealth of Australia, 2015) at 56: 'The north could become an agricultural powerhouse — on par with Brazil's Cerrado — and be recognised globally as a leading region in high quality food production. Reforms to land tenure and improved land surveys could open up a quarter of the

federal government offers up to AU\$5 billion (US\$3.8 billion) in concessional loans to encourage and complement private-sector investment in economic infrastructure in northern Australia, so that agribusiness can develop further there. Vital infrastructure is needed, such as port facilities. The big question, according one carbon agent, is whether environmental protection will keep up with the increase in production. A former government official was very critical of these developments in northern Australia and thought that it is an excuse to clear lands. He referred to the 2015 CSIRO National Outlook that argues that with a minimal carbon price, current agricultural lands will be more productive.<sup>182</sup> According to this respondent, increasing soil carbon is much more valuable than beef cattle land. The same respondent argued that we should focus on changing our diet: ‘Are we certain that Asians, as they get richer, want beef?’ He referred to the development of high-protein plant-based food products that are currently being developed and will become commercially available soon, especially in the Netherlands and the United States.<sup>183</sup>

To produce these plant-based proteins, much less land is needed, and it gives you much of what is required by richer people who want protein-rich food. A diet change is needed to accommodate the increase in food demand and reduce emissions from agriculture. Agricultural countries like the Netherlands and Australia will remain agricultural countries, but can produce more with less resources. Farmers will have to grow different things.

#### ***4.4. Conclusions From Empirical Research***

A wealth of information was found in the case studies and interviews. The following main conclusions can be drawn from the empirical research into Australia’s CFI:

1. The regulatory framework laid down in the CFI Act and associated regulations is considered robust and ensures integrity.
2. Consultants have been the main drivers of the scheme, with associated costs for farmers. Sector organizations play an important role in persuading individual farmers to engage in carbon-farming projects.
3. The monitoring, reporting, and verification (MRV) processes are usually run by consultants because of their complexity, which is costly for farmers. Only where automated/digitized systems exist can farmers manage MRV themselves. Research into and development of such automated monitoring and reporting systems across methodologies is needed.

north’s land area — equivalent to half the size of New South Wales — for new development opportunities.’

<sup>182</sup> CSIRO, *Australian National Outlook 2015: Living Standards, Resource Use, Environmental Performance and Economic Activity, 1970-2050* (Canberra, Australia: CSIRO, 2015), at iii. The report concludes: ‘At payments for carbon farming around A\$40-60 per tonne of CO<sub>2</sub>e by 2030, carbon credits could be harnessed to reward landowners for restoring ecosystems, increasing native habitat by 17% and decreasing extinction risks by 10%, without large additional government outlays.’

<sup>183</sup> A range of start-up companies is developing meat-like products from plants, for an overview, see Anonymous, ‘Silicon Valley Gets a Taste for Food’, *The Economist*, 7 March 2015, <<http://www.economist.com/news/technology-quarterly/21645497-tech-startups-are-moving-food-business-make-sustainable-versions-meat>> (last accessed on 29 August 2016).

4. There seems to be a high level of compliance, although checking for compliance, so far, is mainly done on the basis of audit reports.<sup>184</sup>
5. Although a wide range of carbon-farming methodologies has been adopted, only a few are applied in the farming sector. This is primarily caused by the focus of the scheme on achieving the largest possible amount of abatement against the lowest costs; to a lesser degree, it is due to lack of interest by certain influential agribusiness organizations.
6. The level of ambition differs for the various methodologies: some are considered to be too similar to what farmers are expected to do anyway because the market already offers large economic incentives, while others are considered to promote innovation.
7. Those methodologies that have important co-benefits for farmers, for food security as well as for the broader environment, are heralded as important instruments for change. Focus should be on adopting methodologies that have such co-benefits and do not focus on mitigation alone. A considerable research and development effort is needed before reliable methodologies that foster innovation in all agricultural sectors is achieved.
8. The switch from a purely market-based mechanism, to a mechanism under which the government buys up credits against a fixed price under a long-term contract drafted before abatement is actually achieved has given an enormous boost to the adoption of carbon-farming practices in Australia.
9. To engage the large majority of smaller farms as well, it is necessary to adopt a 'whole of farm' approach that allows farmers to adopt a set of different measures under different methodologies without the need to divide these activities into separate ERF projects with all the associated administration and costs.
10. The expected large increase in global food demand will lead to higher emissions that are difficult to reduce with schemes like the ERF alone. In the long run, a dietary change away from meat products is suggested as the ultimate way to drastically reduce emissions from agriculture.

## **5. Conclusion: Lessons for Regulatory Design Aimed at Reducing Emissions From Agriculture**

This article has reviewed the experience with Australia's carbon-farming legislation, with the objective to articulate lessons for regulatory design aimed at reducing greenhouse gas emissions from agriculture. Both the desk study and the empirical research presented above lead to the conclusion that the Carbon Credits (CFI) Act 2011 provides an elaborate legal framework that seems well suited to assess project applications and issue credits to participating farmers who, through these projects, generate real and additional emission reductions. The 2015 amendments leading to the creation of the ERF increased participation by farmers by reducing uncertainty about the revenue to be generated through the projects. The experiences in Australia form a reliable basis for recommendations to policymakers and regulators around the world who wish to develop a regulatory framework aimed at stimulating farmers to convert to

<sup>184</sup> Recent research shows that this is risky and that enforcement agencies should also develop their own inspection policy and do, for instance, site visits, Jonathan Verschuuren and Floor Fleurke, 'Enforcement of the EU ETS in the Member States', 1-2 *ELNI Review* (2015) 17-23.



farming practices that reduce greenhouse gas emissions or even to broaden climate-smart practices. The following lessons may be drawn.

The first and possibly most important lesson is not a purely legal one. A policy aimed at stimulating carbon farming has to be reliable and provide certainty for at least ten to twenty years. Farmers who want to introduce carbon farming have to implement structural changes to their farming practices with long-term impacts on their business. The policy environment, as well as the financial environment of agribusiness, have to accommodate such long-term impacts. This implies that relying on the carbon market for funding should only be done when there is long-term certainty that carbon credits will earn an acceptable minimum price.

The next lesson also concerns the broader policy background. A policy that has a wider focus on adaptation, food security, resilient and sustainable farm businesses, and securing and creating jobs in the agribusiness sector is likely to be more successful than one that only focuses on reducing emissions from agriculture. Several of the methods accepted or under development in Australia, such as those dealing with soil carbon, show that such co-benefits can indeed be achieved.

Developing climate-smart methodologies that not only deliver real, additional, measurable, and verifiable emission reductions but also foster long-term innovation and create economic, social, and environmental co-benefits is essential for the success of any policy aimed at stimulating climate-smart agriculture. Science has to be central in the development and adoption of methods that are accepted under the regulatory framework. In Australia, much research effort has already gone into method development. International collaboration in method development is important for efficiency reasons. When developing methodologies, special attention must be paid to small farms.

Regulation should focus on projects and should not set uniform rules or simply require farmers to hand in allowances under an ETS. Given the fact that potentially large numbers of farmers should be able to participate, much attention has to be focused on developing automated systems for all phases of the process: from project application to monitoring, reporting, and verification. Project development according to accepted methods needs to be guided by experts. Agribusiness organizations have a role to play here, but most work will be done by the private (consultancy) sector.

Having a robust and reliable MRV system in place is, as with the ETS, essential. The regulatory framework will have to comprise detailed legal rules on MRV. By contrast with most sectors, in agriculture, MRV is very site-specific and can be labour-intensive, especially in the case of carbon sequestration. Again, private consultancy businesses will have to play a major role here. Research is needed to develop reliable and less labour-intensive methods to assess the amount of emission reductions achieved or carbon sequestered.

Despite its fairly poor overall climate change policy, Australia has shown that it is possible to regulate for the reduction of emissions from agriculture and for increased sequestration in agricultural soil and vegetation on agricultural lands. In order to

achieve the Paris Agreement objectives, the rest of the world has to start developing policies and laws fast to unlock the potential of the agricultural sector, so that climate-smart agricultural practices are commonplace before production levels increase following the expected dramatic increase in demand for food products.